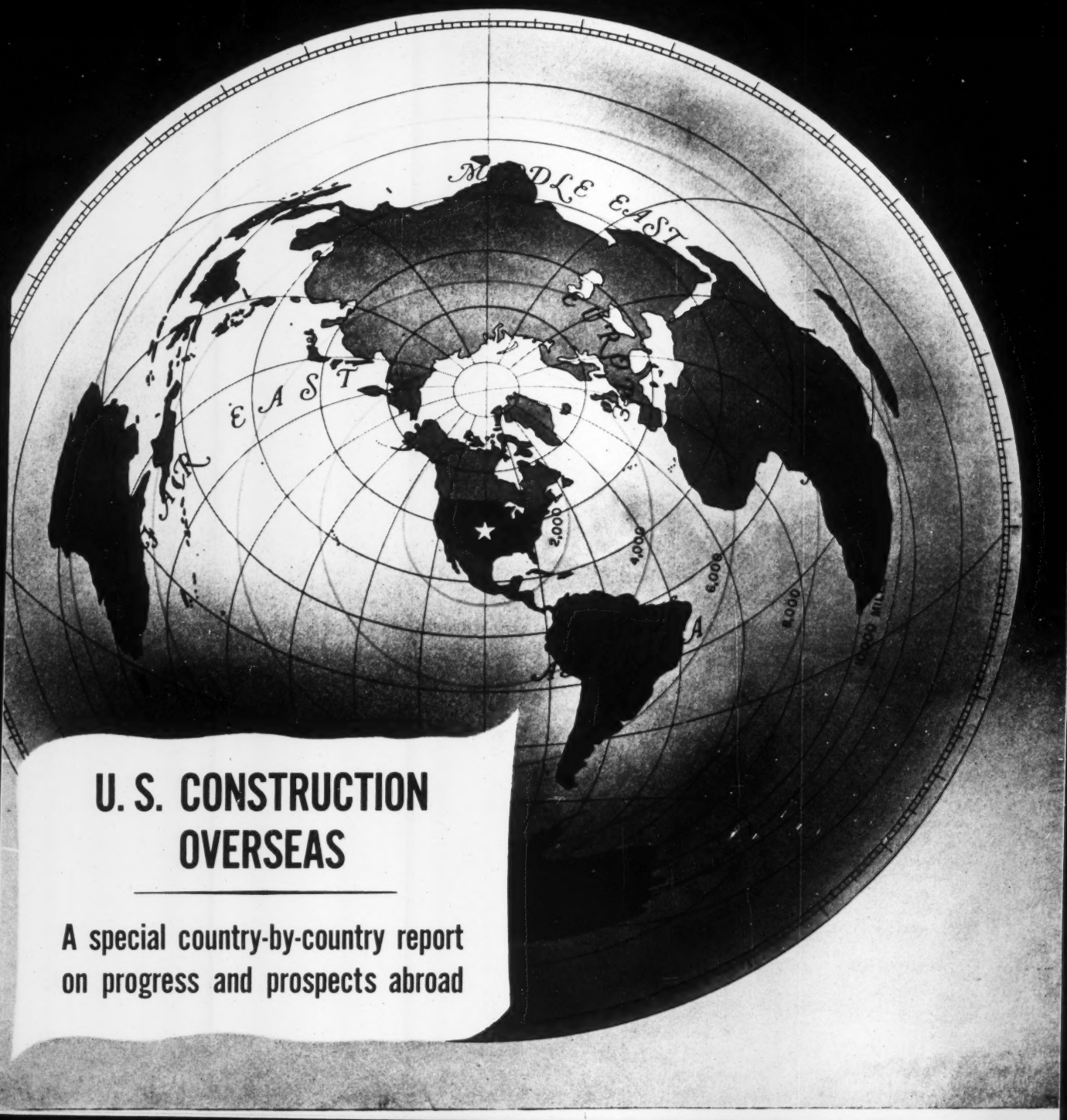
JULY 30, 1953

ENGINEERING NEWS-RECORD

$6.00 A YEAR



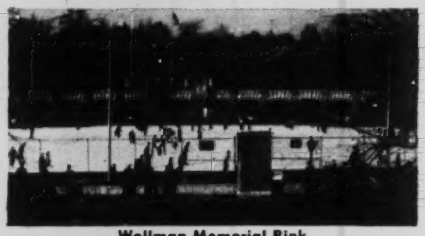
U. S. CONSTRUCTION OVERSEAS

A special country-by-country report on progress and prospects abroad

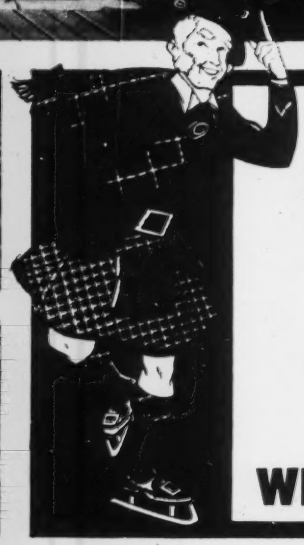
Onondaga County War Memorial Rink

Denver Municipal Stockyard Stadium Rink

Rensselaer Polytechnic Institute Rink



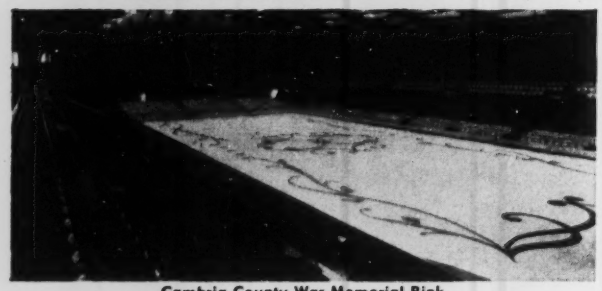
Wellman Memorial Rink



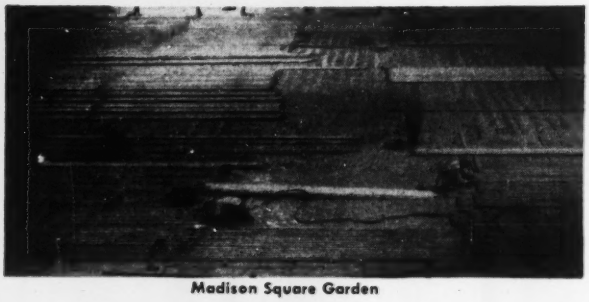
HERE'S WHY—

OVER 80%

of the Ice Skating Rinks built in the past 7 years used BYERS WROUGHT IRON PIPE!



Cambria County War Memorial Rink



Madison Square Garden

Why "skate on thin ice" when you can play it safe with wrought iron pipe? Proof of this material's superior dependability and durability is its outstanding acceptance record according to our records over 80% of all ice skating rinks built in the past 7 years have used wrought iron pipe.

There are good reasons for this confidence. Take fabrication, for instance. In bending operations, wrought iron takes short radius bends, without "springback." This feature speeds and simplifies the job. When the design calls for welded fabrication, users report that wrought iron produces a sound weld, free of pinhole leaks. In threaded and coupled joint design, wrought iron's uniform structure assures sharp, clean, full-depth threads. And during installation, wrought iron pipe's ample mechanical strength withstands damage.

In actual service, wrought iron's ability to combat corrosion, and serve longer at lower cost per year is a matter of engineering record. Tiny fibers of glass-like silicate slag, threaded through the body of high-purity iron, halt and detour corrosive attack, discourage pitting. They also anchor the protective scale, which shields the underlying metal.

You'll find it profitable to investigate wrought iron's many installation and service advantages for ice rinks. Our bulletin, *Wrought Iron in Refrigeration and Air Conditioning Systems,* reviews several installations. Write for a copy, or let us know your particular problem.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, N.Y.

BYERS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

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IF IT'S A STEEL BELT—BE SURE IT'S A GOODYEAR

No other V-Belt gives you so many advantages

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- Highest Belt Efficiency
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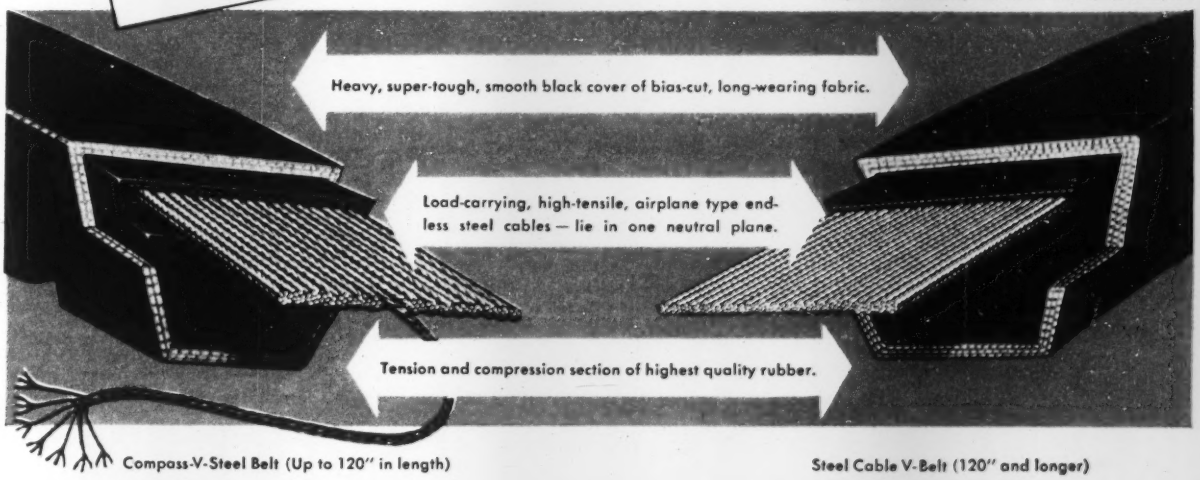
- Greater Strength and Load Capacity
- Minimum Space Demands
- Low Power Consumption

Ask your nearest Goodyear Industrial Products Distributor about Steel Cable V-Belts or Compass-V-Steel Belts for your drives. Or write for details to the G.T.M.—Goodyear Technical Man—at Goodyear, Industrial Products Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose (air, water, steam, oil, special), Belting (V-belts, transmission, conveyor, elevator), and other industrial rubber products. Look for him in your telephone directory under "Rubber Products" or "Rubber Goods."*

HERE'S THE INSIDE STORY

Compass—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio


Heavy, super-tough, smooth black cover of bias-cut, long-wearing fabric.
Load-carrying, high-tensile, airplane type endless steel cables—lie in one neutral plane.
Tension and compression section of highest quality rubber.

Compass-V-Steel Belt (Up to 120" in length)

Steel Cable V-Belt (120" and longer)

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NEW YORK 19, N.Y.

February 27, 1953

Foundation Equipment Corporation
Long Island City, N.Y.

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GROW CONSTRUCTION CO., INC

By George A. Fox
George A. Fox

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ABP Member

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Publisher

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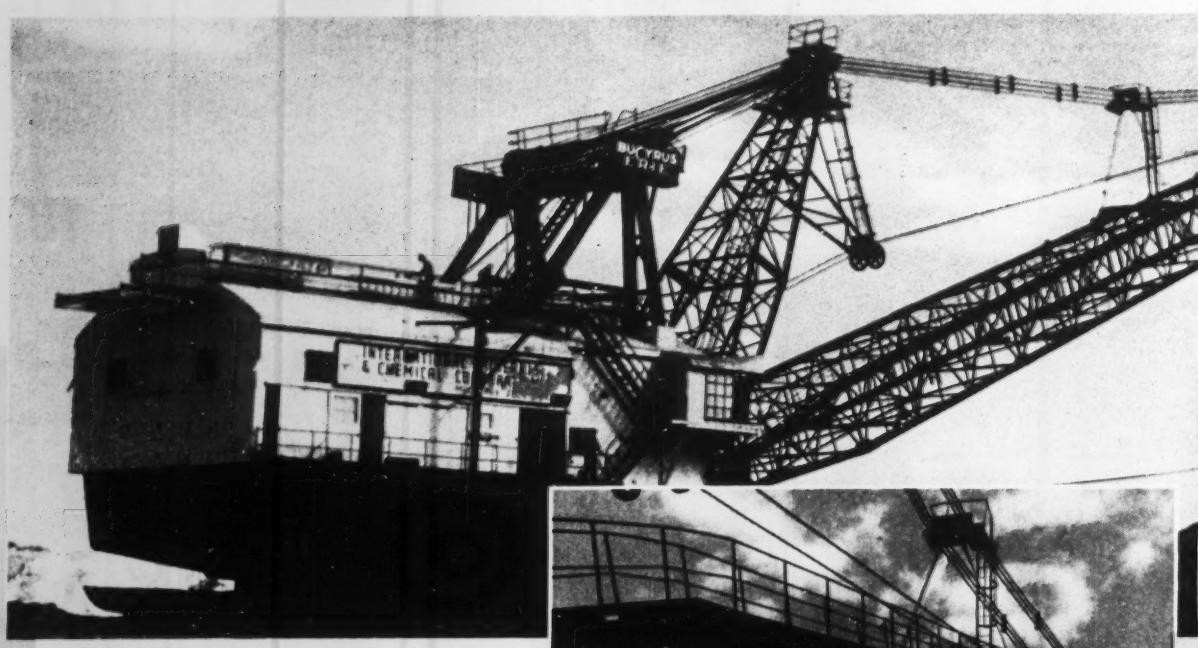
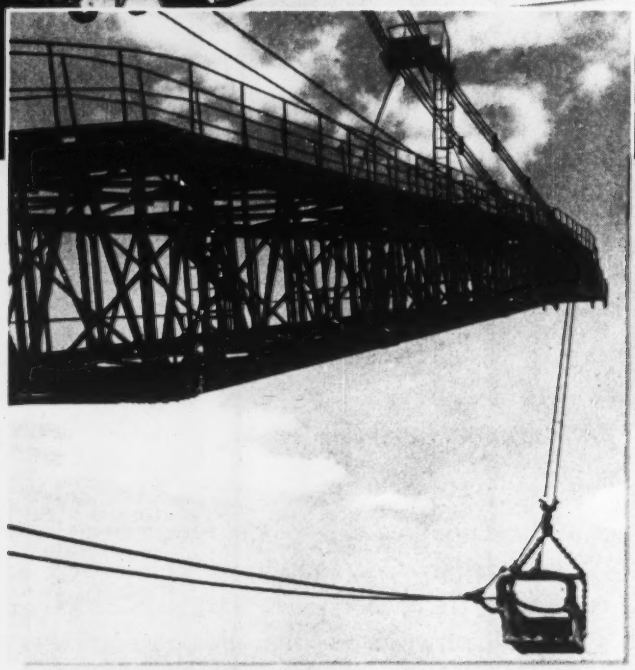
SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

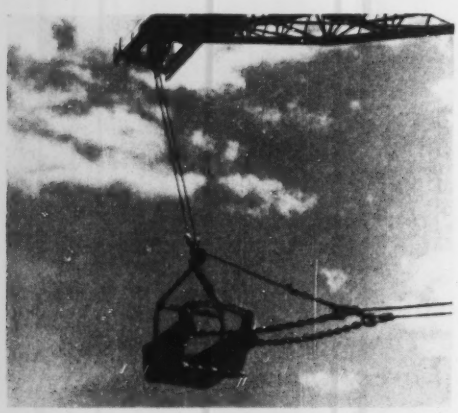
The Bigger Digger moves





THE BIGGER DIGGER makes a round trip once a minute . . . moves 21.5 cu. yds. each trip. Huge loads like that put a terrific stress on boom suspension cables, but Tiger Brand Boom Support Strand has the needed strength.

THE DRAG LINES on the Bigger Digger must withstand a lot of wear and heavy pulls. Special Tiger Brand Drag Lines meet these requirements and give long service.



THE HOISTING ROPES are Tiger Brand too. They have the fatigue resistance needed for constant flexing over sheaves and drums.

Send for helpful guide book

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Room A7136, Rockefeller Building
Cleveland 13, Ohio

Please send me, without obligation, a copy of your "Wire Rope Recommendation Book."

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Company.....

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1,000,000 cu. yds. a month

-with Tiger Brand Wire Ropes

● This huge dragline scoops out overburden and phosphate matrix at the rate of 21.5 cu. yds. per minute. It's the Bigger Digger at International Minerals & Chemical Co.'s phosphate mine near Mulberry, Florida. Drag lines, hoist ropes, and boom suspension cables on the Bigger Digger take a lot of hard wear—and they have to be strong. Amercian Tiger Brand Wire Ropes provide the right combination of strength, wear resistance, and flexibility for these tough jobs.

The duty on the boom suspension cables is especially exacting. The Bigger Digger has the longest boom on record—215 ft. long—and the suspension cables, besides great tensile strength, must possess strictly uniform physical properties. Tiger Brand Boom Support Strand just fits these tough requirements.

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When the Cochran Foil Company, Louisville, Ky., wanted siding as outstanding in appearance as in performance, the specification was obvious... Reynolds Ribbed Embossed Siding. Here is rustproof, corrosion-resistant aluminum *plus* modern architectural design. Applied cost is low. Maintenance cost is practically nil. Aluminum's heat-reflectivity cuts the cooling cost of the building in summer, cuts fuel cost in winter. Light-reflective inner surface is a well-known extra advantage. For cost-cutting efficiency, specify aluminum. For efficiency *plus new* beauty, make it Reynolds Ribbed Embossed Siding.

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WIDTH: Over-all width 33⅜", nominal coverage 32".

RIBS: Pitch 4" center to center, depth 1".

WEIGHT: 59 lbs. per 100 square feet.

*Comprehensive material and installation service on Reynolds Industrial Building Products now available through an approved jobber-erector system. For literature and technical data, call the nearest Reynolds office listed under "Building Materials" in classified phone books of principal cities. Or write to: **Reynolds Metals Company,** Building Products Division, 2009 South Ninth St., Louisville 1, Kentucky.

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superhighways...

built with

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aggregate plants

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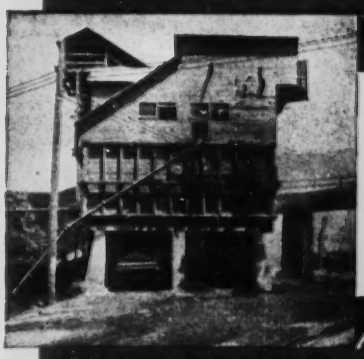

Pennsylvania Turnpike System, Bedford County

Penna. Turnpike Commission photo

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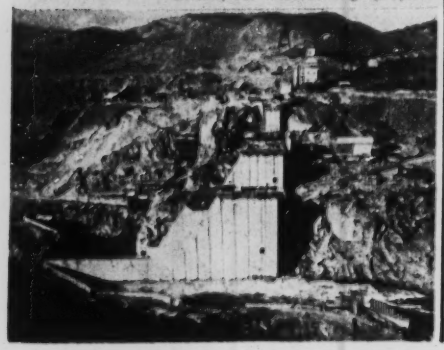
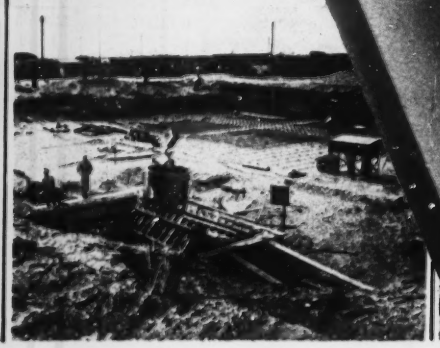
*PROTEX T.M. REG

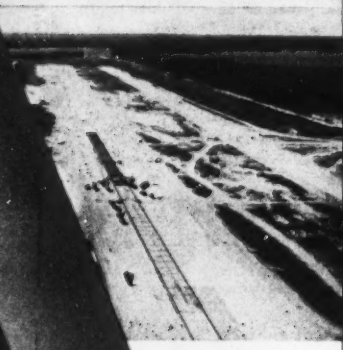
Waneta Power Dam, Consolidated M. & S. Co., Trail, B.C., Canada. Another half-million tons of Protex concrete, where climatic changes are severe and placement difficult. Protex was specified specifically for this 230' high project.



Heat and Power Plant, Anchorage, Alaska. Footings and foundation for Eielson AFB plant, using Protex concrete, poured under adverse weather conditions.



International Air Port, San Juan, Puerto Rico. This construction on filled-in marshland, used Protex air entrained concrete for smoother surface, easier finishing and improved placeability.



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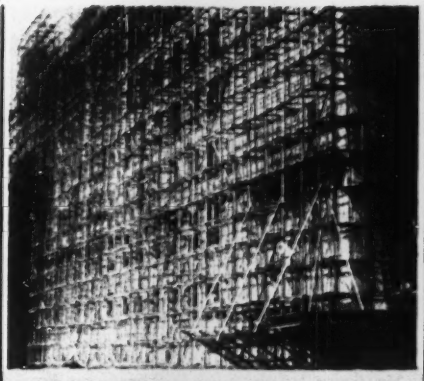
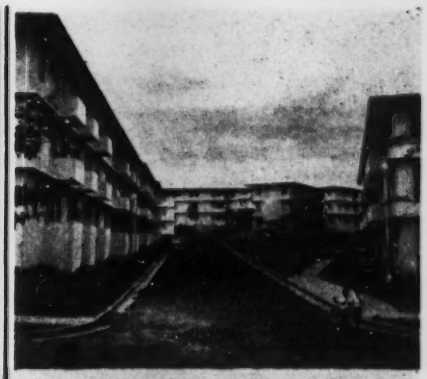
Rio Lempa Dam, El Salvador. This giant project used Protex air entraining agent for high quality concrete under normally unfavorable labor and climatic conditions.



Fuji Bank Building, Tokyo, Japan. Economy in this new bank building was realized in initial cost and time—and appearance was permanently improved with Protex concrete.



San Juan Housing Project, Puerto Rico. This new project, constructed on filled-in marshland, used Protex air entrainment for easier placement, reduced segregation and better surface texture.

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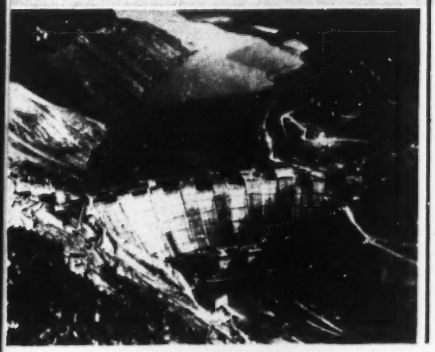

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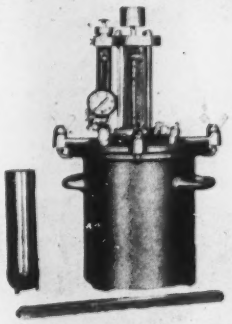

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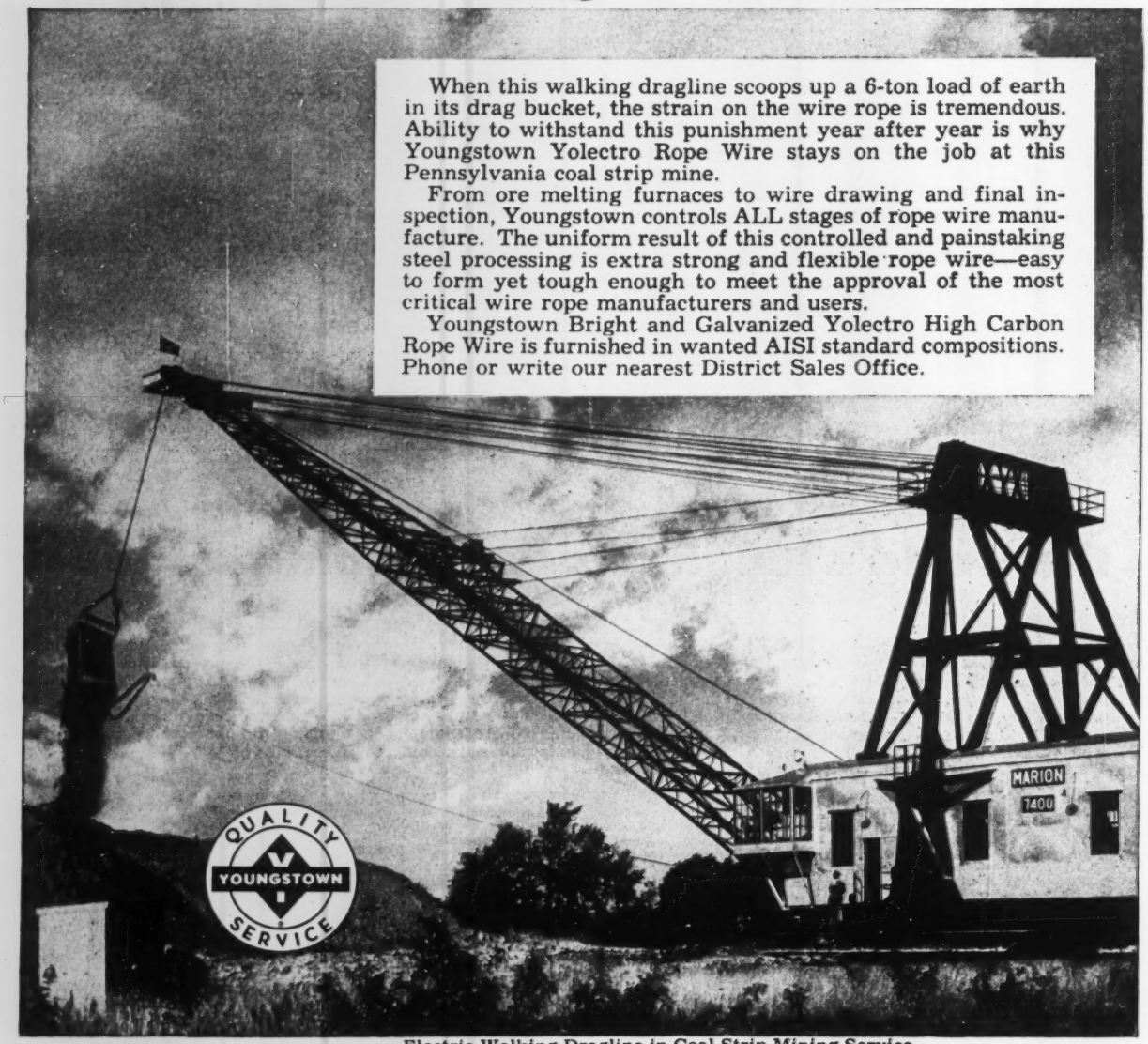

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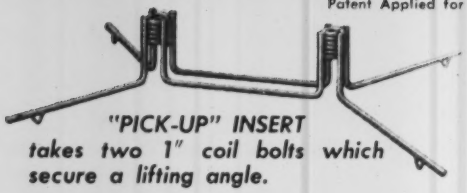
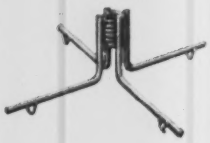
3 SUPERIOR ACCESSORIES FOR more efficient handling of "TILT-UP" SLABS

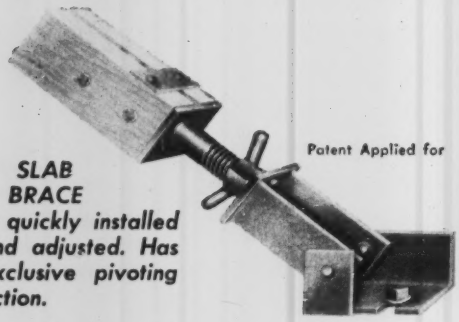
Patent Applied for



***"PICK-UP" INSERT** takes two 1" coil bolts which secure a lifting angle.*

***"ANCHOR" INSERT** in both the "Tilt-Up" slab and the floor slab provides anchorage for slab brace bolts.*





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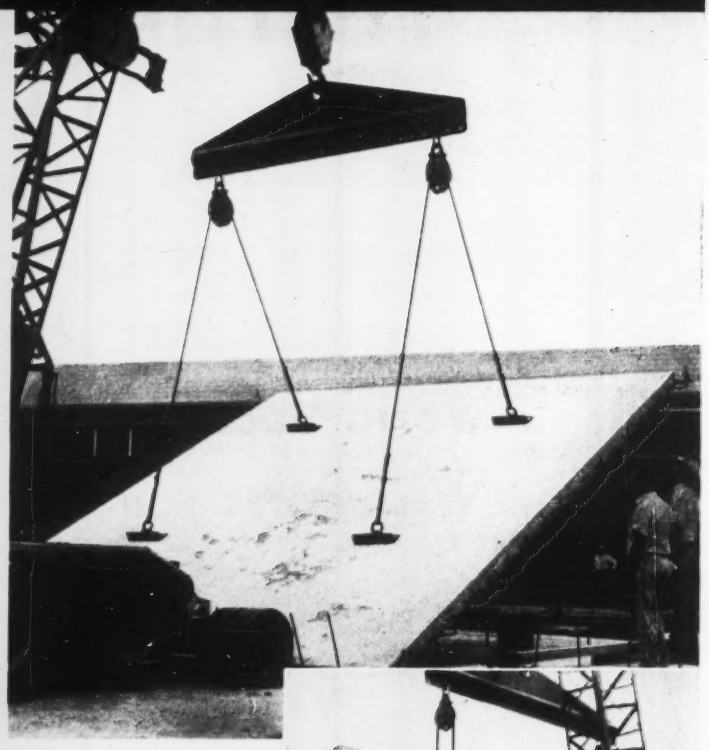

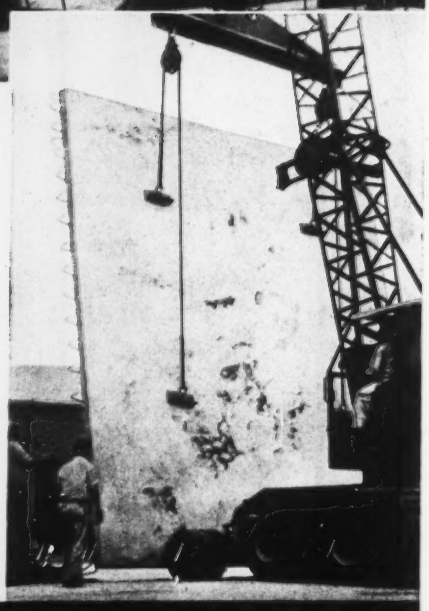

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Wherever slabs are being "tilted-up" . . . on the Pacific Coast . . . in the Midwest . . . the South, and in the East . . . contractors are consistently using Superior Inserts, Anchors and Braces. For details request a copy of Bulletin TU-2.

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2100 Williams St., San Leandro, Calif.

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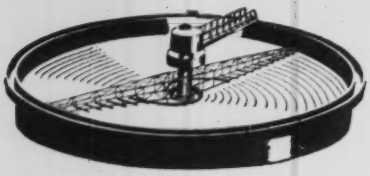
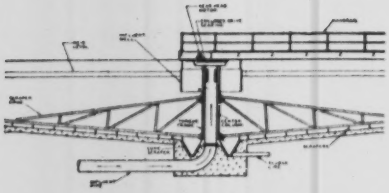
Construction Equipment Division
LIMA, OHIO, U.S.A.



Center-Discharge
Center-Feed
Clarifiers



One reason for the efficiency of Hardinge Clarifiers is the fact that the influent goes directly to a central stilling well and the underflow also is centrally removed. This promotes quick disposal of the heavier solids immediately upon entry—makes less work for the rotating sludge scrapers. The clear effluent overflows the tank periphery, where velocity is at a minimum. Bulletin 35-C-55.

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READER COMMENT

Soil compaction methods

SIR: Your article, "Seven Years Later, San Diego Doubles Aqueduct" (ENR July 23, p. 35) prompts the following comment:

In describing the compaction of backfill around and under the pipe, the article states that a "saturation and vibration" method was employed using concrete vibrators and a water jet. Successful compaction of cohesionless soils has been achieved through the process called Vibroflotation, which works through vibration and external force together with simultaneous introduction of a liquid. The work is performed by a machine called Vibroflot.

Both the process and the machine are fully covered by patents that are controlled by this company.

J. PAUL SCHEETZ
Vice President
Vibroflotation Foundation Co.
Pittsburgh

Highway award papers

SIR: It is with more than mild surprise, that I read in ENR June 25, the results of the General Motors Corporation contest for the improvements of our highways, i.e. the Moses plan for better highways.

In reading the objectives of the contest when announced I applauded the method of reaching for, and encouraging, some grass roots ideas in the solution of our highway problems. After reading the results of the supposedly best plan, "proceeding on established orthodox lines", that offers nothing that has not been repeated a great many times before, one wonders if the American people have supposedly reached the end of their ingenuity. I wonder what Ford or Edison's reaction would have been to this, or what Charles Kettering's reaction would be!

It will be said, of course, that it is easy to criticize; but it is difficult to remain noncommittal at some of the suggestions. The outstanding suggestion seems to be that expenditures for roads should be doubled. It doesn't take $25,000 worth of thinking to state this obvious fact. Another, make inside parking facilities mandatory for new structures. It would seem a major victory to make outside off-street parking requirements stick, let alone inside.

Plans Nos. 17 and 18 call for cutting down road speeds and reducing the maximum sizes and weights of trucks and taxicabs. Why a taxicab should even be questioned in this regard is difficult to understand. Truck sizes and weights are getting larger instead of smaller and will probably continue up to their economic limit. Instead of trying to fight this, why not design for them and proportion this increased cost back on the trucks where it rightly belongs.

As to speeds, cars are being made to travel faster each year. Why not accept the inevitable, and make the highways as fool proof as possible by thorough channelization aided by divided highways and one way roads.

This is a modern changing world, lets get our highray program in step with it.

N. R. DRULARD, *Commissioner,*
Harbor & Bridges,
City of Toledo.

Safety First

SIR: Your article on "Safety: A Superintendent's Job", of July 9, 1953 issue was very interesting. Especially so when viewed with the front cover picture of the same issue. This picture shows one man riding on a form being moved by a crane and another man climbing up a ladder of horizontal reinforcing.

I. GANZ
Ammann & Whitney
New York City

CALENDAR

City and regional planning programs, M.I.T., Cambridge, Mass., Aug. 21-Sept. 4.

Noise reduction program, Acoustics Laboratory, Massachusetts Institute of Technology, Cambridge, Mass., Aug. 24-Sept. 4.

Joint meeting International Association for Hydraulic Research and Hydraulics Division of the American Society of Civil Engineers, University of Minnesota, Minneapolis, Sept. 1-4.

American Concrete Pipe Association, annual short course school of instruction, Sherman Hotel, Chicago, Ill., Sept. 10-12.

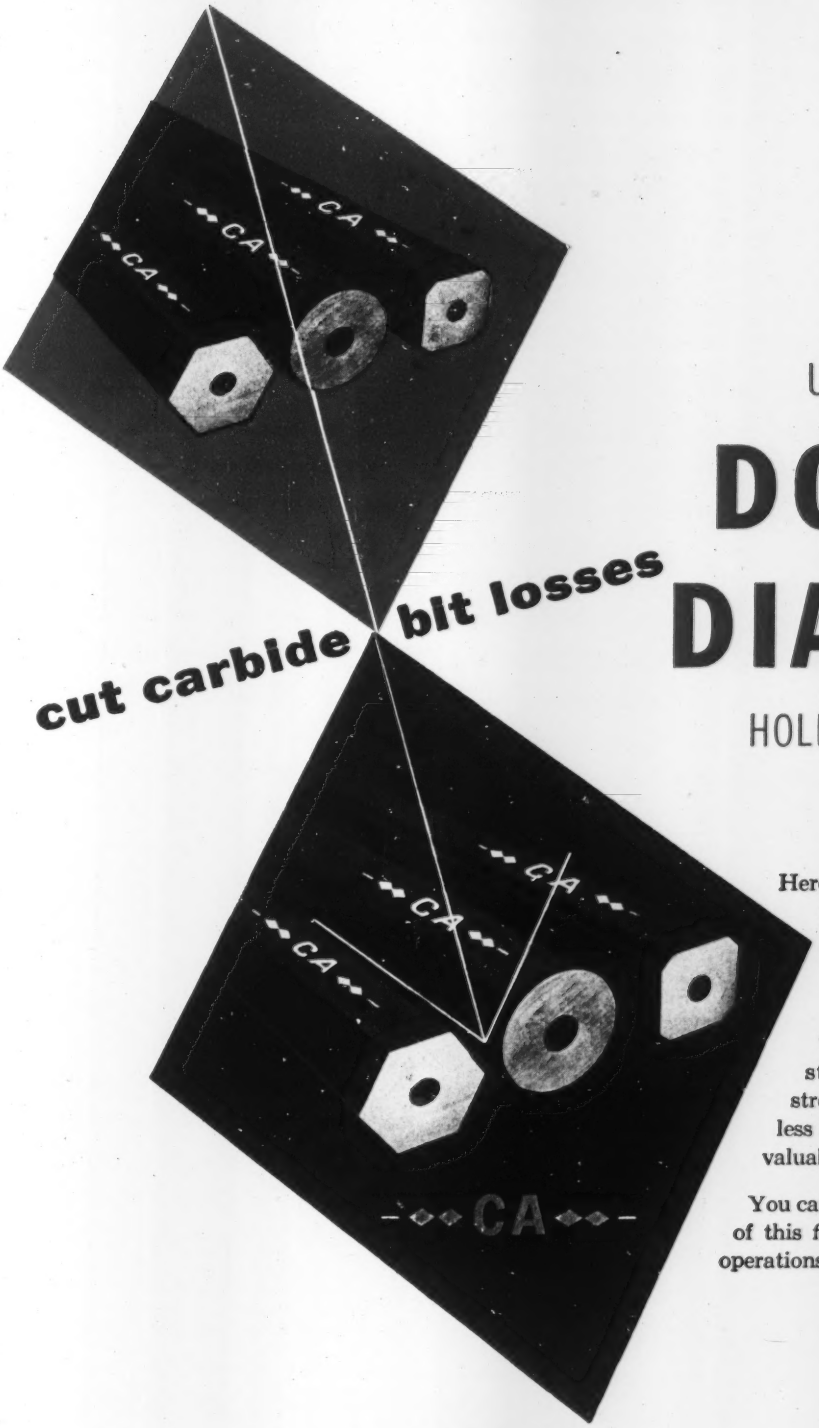
American Institute of Parks Executives, Denver, Colo., Sept. 13-18.

National technical conference on lighting, Illuminating Engineering Society, Hotel Commodore, N. Y., Sept. 14-17.

American Concrete Pipe Association, executive committee, Castti Harbour Hotel, Bermuda, Sept. 19-30.

National highway conference of county officials, American Road Builders Association, Lake Delton, Wis., Sept. 24-25.

National Electrical Industries Show, 69th Regiment Armory, New York City, Sept. 29-Oct. 2.



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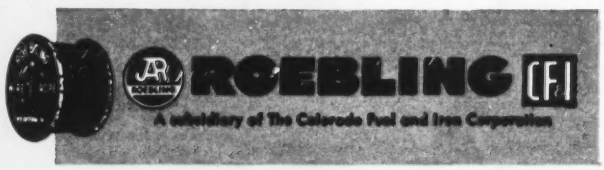

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THE CONSTRUCTION WEEK

- **Clean bill**—Motorists who've been concerned about the condition of the year-old Chesapeake Bay Bridge can now rest easy: The bridge hasn't settled or moved one iota. J. E. Grenier Co. engineers completed a first annual inspection, reported that optical illusion caused by the long curving vista of parapets, handrails and curbings are exactly illusions—there are no actual dips or irregularities.

- **Veto reasons**—Disapproving a bill to reorganize Ohio's state highway department, Gov. Lausche added strength to the battle for recognition of the profession by Ohio professional engineers. Said Lausche: The bill is disapproved because (1) it would remove the requirement that the director be a licensed professional engineer; (2) it would set up separate divisions to be headed by engineers under a non-professional chief; (3) it would fail to put the division heads under civil service.

- **More wheels**—If you're in the mood to add up signs on internal moves in labor (like that hint on the reasons for the Carpenters' throwing over the traces in New York in ENR July 9, p. 17) paste this one in your hats, too:

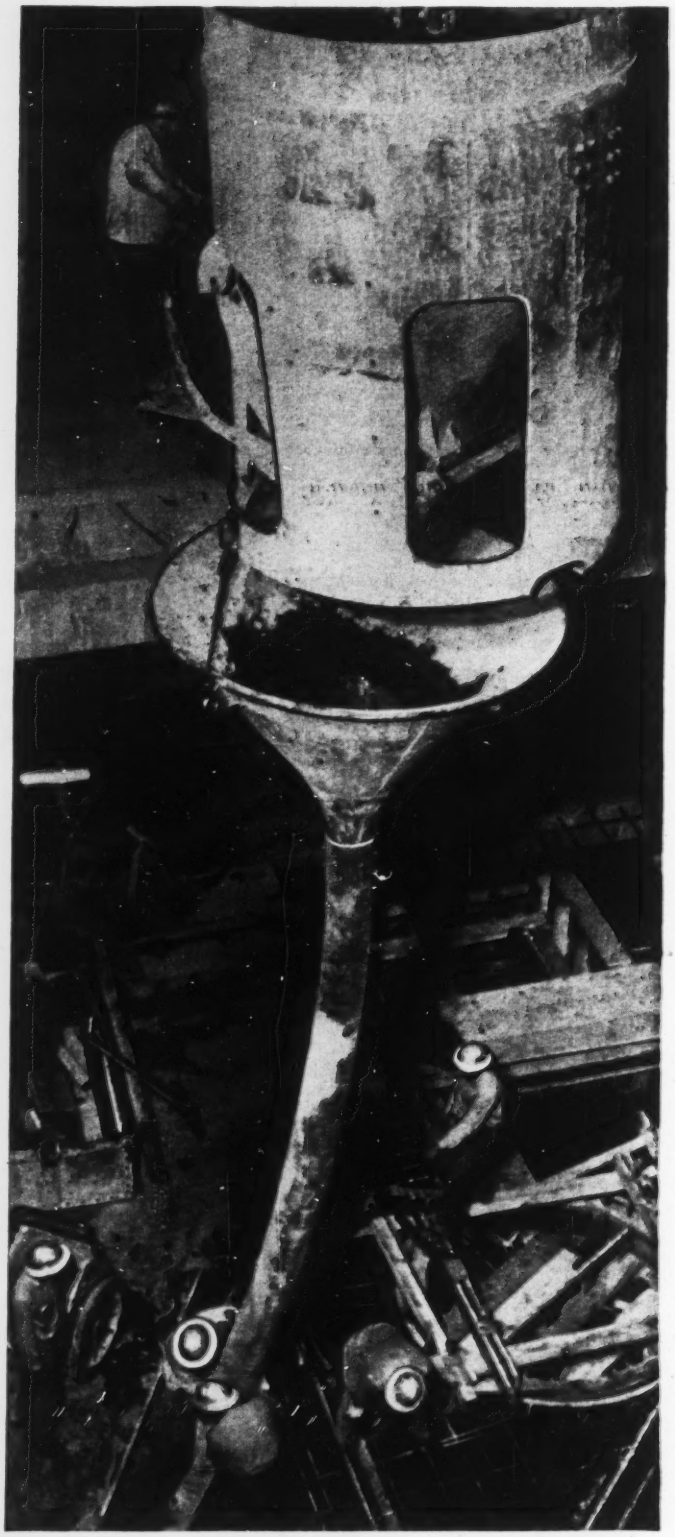
  Those super-secret meetings in Washington of Coal's Lewis, Steel's McDonald and Teamsters' Beck aren't aimed at a new union coalition—they're aimed (say the pundits) at (1) Walter Reuther of CIO and (2) George Meany. It could work this way: Lewis takes his miners back into CIO—which would probably drive Reuther's auto workers out, probably wreck CIO. Then McDonald would go into AFL, and with Beck's help, unseat Meany. Then the three could easily push through a CIO-AFL merger.

- **Turnabout**—Archeologists are often concerned with construction—but construction men seldom with archeology. But Missouri's State Highway Department and one of its contractors—Porter, DeWitt Construction Co.—got high praise from Washington University (St. Louis) for turning aside from a new highway project to permit excavation of an Indian village site dating to before Christ. The department supplied surveyors, and the construction company machinery to aid in excavations.

- **Statistics**—Sign-of-the-times item: Average starting salary for June engineering graduates of the Illinois Institute of Technology has reached an all-time high of $362 a month, according to IIT's placement service. Architectural graduates got the highest start (an average of $399 a month); civil engineers were sixth in line (at $367 a month average).

- **Pipelines**—There was plenty of activity in the oil pipeline business as the season advanced toward heating periods: Union Oil Co. of California planned a $5-million terminal at Oleum, Calif., as first step of a $40-million program; Yellowstone Pipeline Co. will start this summer on a 549-mile, $20-million line from Billings, Mont., to Spokane; Triangle Pipeline Co. is set to build a 560-mile, $27-million line from Arkansas City to Covington, Ky.

At Grand Coulee they poured concrete around corners... with U. S. Elephant Trunk Hose



Grand Coulee Dam in the State of Washington is the world's largest concrete structure—containing over 10 million cubic yards, weighing over 22 million tons.

To keep up with strict construction schedules, contractors on the dam used U.S. Elephant Trunk Hose to pour concrete speedily into tight forms and inaccessible places. Because it is so light and flexible, this hose can be easily maneuvered—the concrete was literally poured around corners.

In designing this unusual hose, United States Rubber Company engineers were backed by more than a century's experience in hose manufacture. "U.S." today makes hose for every imaginable type of work—and each hose is a *quality* product. Call on any of our 25 District Sales Offices, or write to address below.

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Short term, the Korean truce won't change Administration plans. The arms buildup still has months to go before a turndown shows up. Construction of military installations here and abroad will go on as scheduled. Draft of men, and the manpower take in industry will taper slowly. Only a real armistice will change these plans—and word on just how sincere the Reds are won't come for 90 days, if then.

•

Construction will stay high. The military expects to get started on its $529,-million base-expansion program (ENR July 16, p. 24) just as soon as Congress okays the new bill. The money is already on hand.

Highway spending in fiscal '55 will be up from the year just ended.

Public works are being cut by Congress (see page 20), but it's still a multi-million-dollar program for the Corps of Engineers, Tennessee Valley Authority, etc.

Housing is trending downward, but only slightly. There'll still be a million-plus starts this year. And the Administration is taking steps to keep building going strong once the new-start downturn takes on a definite slide.

•

Home trade-ins are the newest trick. The Federal Housing Administration and the National Association of Home Builders are jointly experimenting with a system almost identical with the trade-in practices in automobiles. It was first suggested nearly a year ago (ENR Nov. 13, 1952, p. 19), has been pushed by housing interests since. Here's how it will work on housing:

- For a fee, FHA will assess the house of an owner whom a builder is trying to persuade to buy a newer, bigger home. FHA will tell the builder how much equity the owner has, what repairs are needed, etc.
- After the assessment, the builder figures how much repairs are needed, subtracts that from the owner's equity and takes the difference as down payment on the new house.
- The builder relieves the owner of disposing of the old house, but he also has to figure with a sharp pencil to keep from losing money.

The scheme is being tried in five cities: New Orleans, Shreveport, Columbus, O.; Hartford, Conn., and Washington, D. C. FHA and NAHB have hopes the trade-in idea will catch on, help offset current tight money effects on housing, and establish a stabilizing influence over the long haul. Builders are confident people still want to buy—particularly owners of two-bedroom small houses bought when that was all the family could afford. The test runs will be confined to trade-ins of two-bedroom homes.

•

One-for-one exchange of Fanny Mae and FHA-insured and VA-insured mortgages started this week. The plan is part of the new housing act. FNMA will approve purchase of mortgages from an investor equal to the amount of mortgages the investor buys from FNMA. The FHA and VA mortgages FNMA will take must bear the higher interest rates recently put into effect.

•

Construction of two new aluminum plants may be the outcome of the Justice Dept.'s veto of Aluminum Company of America's contract to buy the 600,000 tons of pig aluminum from Canada's Aluminium, Ltd. Wheland of Tennessee and Olin Industries had about given up hope of getting into the field because the government would not give them loan guarantees. Now the Office of Defense Mobilization is reopening Wheland's and Olin's plea.

Congressional economy ranks hold on construction funds

Army Engineers civil projects cut $53 million with no new starts; Administration requests for AEC, TVA met

The big federal construction money bills began clearing Congress last week as lawmakers worked on a speeded-up schedule toward an early August adjournment. Overall, the orders to the government agencies were to go ahead with approved projects, but make no new starts.

Congress was clearing construction funds totaling more than three-quarters of a billion dollars. It was hard at work on two other appropriation bills which would double that amount.

On the whole, Congress lived up to its "tough economy" label. Cuts ranged up to 70% of the old Truman budget, and total funds approved were considerably under requests of the Eisenhower Administration.

Here is a rundown on construction funds which were taking the final congressional hurdle last week:

- Army Corps of Engineers, civil functions, $278.7 million—about $53 million under the Eisenhower request.
- Army Corps of Engineers, Mississippi River flood control, $36.6 million—a reduction of $1 million under the Eisenhower budget.
- Atomic Energy Commission, construction, $166 million—the same amount asked by the Administration.
- Tennessee Valley Authority construction, $178.4 million—exactly the amount requested by Eisenhower.
- Veterans Administration, hospital construction, $17.5 million—$65 million less than requested in the Truman budget.
- Rural Electrical Administration, loan funds, $240 million—a whopping increase of $95 million above the Eisenhower request.

Still facing a final House-Senate conference was the funds bill for the Interior Department for which the Senate had approved construction funds of more than $170 million.

Congress was just getting down to work on the $529-million military construction bill (ENR July 16, p. 24), but it was expected to be voted before adjournment.

• **Civil functions**—House and Senate conferees split the difference between their versions of the rivers and harbors and flood-control fund bills. Final figure for general construction of these waterway projects was $278.7—about $25 million above the original House figure and some $30 million under the Senate-approved figure. Multipurpose projects including power accounted for most of this amount (see table). The Corps had $13.5 million left over from previous appropriations, but Congress used this "surplus" in allocating funds for the current fiscal year.

Congress adhered rigidly to the "no new starts" formula of the new Republican Administration, deleting funds for initiating construction on the huge Ice Harbor and Detroit hydroelectric projects in the Pacific Northwest. The Truman Administration had requested funds for both.

Restrictions written into the conference report makes it practically impossible to continue construction on the controversial Table Rock Dam in Arkansas and Missouri. Only $1 million is made available for this work, and extensive power and cost studies are requested before any part of this is spent.

Final congressional action eliminated restrictions voted by the House to limit the height of Garrison Dam in North Dakota to 1,840 ft above sea level.

Congressional experts doubt there will be sufficient survey funds available to permit Corps of Engineers investigation of alternate sites for location of the proposed Libby multipurpose project in Montana.

Bank stabilization works along the main stem of the Mississippi will get $19.1 million of the $36.1 million appropriated for Engineers flood-control construction on the big river and its tributaries.

Cutbacks in the Engineers' civil functions appropriations will call for rescheduling construction on a number of the larger projects. In some cases such as Fort Randall in South Dakota and The Dalles in Oregon the lesser funds may add as much as a year to the construction time.

• **AEC funds**—For plant and equipment, Congress voted the full $166

ARMY ENGINEERS MULTIPURPOSE PROJECTS

Project	Truman Budget	Eisenhower Budget	House	Senate	Final
	(in millions of dollars)				
Arkansas: Blakely Mountain	6.0	5.5	5.5	5.2	5.2
Bull Shoals	2.0	2.0	2.0	2.0	2.0
California: Folsom	14.8	9.8	8.0	9.0	8.8
Florida: Jim Woodruff	10.4	7.9	7.0	7.5	7.3
Georgia: Buford	9.1	8.5	5.0	8.0	7.5
Clark Hill	2.3	2.3	2.3	2.3	2.3
Idaho: Albeni Falls	7.7	7.2	6.0	6.8	6.8
Missouri: Table Rock	10.8	0.0	0.0	3.5	1.0
Nebraska: Gavins Point	17.8	12.1	10.0	11.2	10.3
North Carolina: Kerr Dam	1.5	1.5	1.5	1.4	1.4
North Dakota: Garrison	39.0	31.0	27.0	29.0	27.5
Oklahoma: Tenkiller Ferry	.3	.2	.2	.2	.2
Oregon: Detroit reservoir	1.3	0.0	0.0	0.0	0.0
McNary lock and dam	28.2	27.7	25.0	27.7	26.3
Lookout Point	20.3	20.0	18.0	18.0	18.0
The Dalles	58.4	37.4	29.3	34.0	32.0
South Dakota: Fort Randall	22.7	14.7	11.0	13.6	11.5
Oahe Reservoir	14.8	8.3	8.3	8.3	8.3
Tennessee: Cheatham lock and dam	5.8	4.8	3.0	4.0	3.0
Old Hickory	18.0	12.6	12.6	11.9	12.6
Washington: Chief Joseph	30.0	25.0	23.0	23.7	23.4
Ice Harbor	4.9	0.0	0.0	0.0	00.0
Total	327.0	238.4	194.7	227.3	215.4

million asked by the Eisenhower Administration for the Atomic Energy Commission. Full construction funds for AEC plants at Oak Ridge, Tenn., Paducah, Ky., and Portsmouth, Ohio were voted last year, and the unspent portion of that $2.8 billion is available for continued construction.

Of the additional funds voted, $7 million is earmarked for research, development and construction of at least one large-scale reactor capable of producing electric power.

• **TVA construction**—Congress also went along with the Administration on the $188-million TVA budget, of which $178.4 million is for construction and power equipment.

These funds are to be used for continuing work on 34 power units at the agency's steam-electric generating plants, and for the installation of one new steam unit each at the existing John Sevier and Kingston plants.

Republicans knocked out the $30 million requested by the former administration for a new 450,000-kw steam plant north of Memphis.

A major portion of this electric generating expansion is to serve AEC gaseous diffusion plants in Tennessee and Kentucky.

• **VA hospitals**—Congress earmarked $17.5 million for planning and construction of Veterans Administration hospital facilities at San Francisco, Calif., Topeka, Kans., and Houston, Tex. This was a big cut from the $48.8 million approved by the House.

The VA was directed to survey its hospital construction program and its possible hospital sites and to give a report to Congress by next Feb. 1.

Small business bill picks up from RFC

Small business establishments will be able to get construction loans for expansion from the new Small Business Administration under essentially the same conditions required for Reconstruction Finance Corp. Loans.

The SBA legislation, which received final approval in Congress this week, provides that a concern first will have to be turned down for direct and participating private loans before it can apply for an SBA loan. Individual loans would be limited to $150,000. But in the case of a participating loan in which the government's share could range from 10 to 90%, it would be possible to get a loan of 1.5 million. The government's share could not exceed $150,000.

The bill enables RFC to continue its lending functions for 60 days after enactment and then to liquidate until June 30, 1954.

3-dam Hell's Canyon plan is supported by former Army Engineers deputy chief

Farm interests want FPC's assurance that any license will provide cheap power for fertilizer production

Idaho Power Co. last week faced up to one of the more troublesome arguments against its proposed three-dam power development of the Hell's Canyon stretch of Snake River.

The argument is that federal studies, including one made by the Army Corps of Engineers, have generally recommended a high-dam development at the Hell's Canyon site. This was a key issue as Federal Power Commission hearings on the Idaho power application went into their fourth week. (ENR July 23, p. 28).

Testifying for the company, former Deputy Chief of Engineers Thomas N. Robins made these points:

• The high Hell's Canyon development has been included in the so-called main control plan "as a last resort" because of opposition to two other superior sites by farming and fishing interests.

• The three-dam plan with the storage in the upper dam and the remaining head developed by two downstream dams is, in Robins' opinion, the "most economical and best plan."

• **Presents cost data**—Robins, a former division engineer in the Army Corps of Engineers, told FPC examiner William J. Costello that he had submitted numerous official reports on Columbia and Snake River developments during his 30 years with the Corps. He presented his own analysis of the relative costs and power capabilities of the high and low dam plans on the basis of either being constructed as a federal project. A summary of his cost data:

	Idaho Power 3-dam plan	Federal high-dam plan
Capital cost	$163 million	$422 million
Prime capability	633,000 kw	842,000 kw
Annual cost per kw of prime power	$12	$24

Opponents of the Idaho power application received a boost from the powerful American Farm Bureau Federation. Matt Triggs, representing the federation, asked FPC not to issue a license to the company until it was assured that the three-dam development would produce economical power for phosphate processing in Idaho.

AFBF also wants a condition written into the license, if and when it is issued, which would insure an adequate supply of power for development of the phosphate deposits, at minimum and non-discriminatory rates.

Triggs said his organization is interested in the phosphate development because the mineral is needed for fertilizer, and several state farm bureaus have an ownership interest in the Idaho deposits through the Central Farmers Fertilizer Co.

• **Objection to procedure**—As hearings continued this week, Idaho Power attorney R. P. Parry attempted to force a showdown on hearing procedure. Opponents, headed by the National Hell's Canyon Assn. Inc., have put off cross-examination of company witnesses on the grounds that NHCA is not prepared to conduct it at this time. Thus far examiner Costello has permitted this and tentatively agreed to call the witnesses back at a later date. This could result in dragging out the hearings over a period of months.

Parry argued that attorneys for NHCA are thoroughly familiar with the Hell's Canyon situation since two of them, C. Girard Davidson and Mrs. Evelyn Cooper, were in the Interior Department during the years when Hell's Canyon was under study. He further noted that former FPC chairman Leland Olds is giving advice and counsel to the opponents and said Olds has had opportunity to familiarize himself with the issues in this case. Parry asked that cross-examination immediately follow direct testimony.

Two other company witnesses described estimates of future upstream water depletion from irrigation of new lands. Their general conclusion: Upstream irrigation demands will increase at such a rate during the next fifty years as to interfere with the storage demands of a high dam at Hell's Canyon.

Idaho reclamation engineer Mark R. Kulp estimated that irrigated acreage in the Snake River Basin will increase at a rate of 30,000 acres per year until 1985.

Harry M. Dewey of Twin Falls, Idaho, former Deputy Reclamation Commissioner of Idaho, testified the development of upstream storage on the Snake will make the high dam impractical.

"If federal agencies are interested in protection of the Columbia River from floods, Dewey said, "they should explore the possibilities of multiple-use projects on the Clearwater and Salmon Rivers . . ."

Defense post filled

New assistant secretary to handle construction, property management

President Eisenhower last week named the new Assistant Secretary of Defense for Properties and Installations. He is Franklin G. Floete, retired businessman of Des Moines, Iowa, and formerly head of Wood Brothers Construction Co., of Lincoln, Neb.

The appointment of Floete—a newcomer to the Washington scene—came as a complete surprise to Washington observers. Speculation had been that Frank Creedon, Charles E. Wilson's deputy for installations, would get the job (ENR July 9, p. 23).

Last week Floete was already busy attending the top-level defense conferences held at Quantico, Va., and getting briefed on his job by Pentagon officials. Immediately facing him on confirmation is the problem of handling the Defense Department's military construction program of fiscal 1954 that got rough treatment from Congress.

Although long associated with construction, Floete is not an engineer. He was graduated from the University of Wisconsin with a B.A. degree and from Harvard Law School. During World War I he served as an Army captain. In the early Twenties, Floete operated a bank and a small manufacturing business at Armour, S. D.

In 1932 he became associated with Wood Brothers Construction Company and the Lancaster Corporation of Lincoln, Nebraska, first as comptroller and later as president. During World War II Floete owned and operated the Mid-town Motors of Des Moines, Iowa. And also the Iowa Ford Tractor Company from which he retired in 1952.

FRANKLIN G. FLOETE is new Assistant Secretary of Defense for Properties and Installations.

Under Reorganization Plan Number 6 which revamped the sprawling activities of the Department of Defense, a total of ten posts of assistant secretary were created.

The job of Assistant Secretary of Defense for Properties and Installations was set up to handle all matters for the military dealing with public works construction, real property management, reserve plants and facilities, and family housing. When the reorganization plan became effective late in June, Defense Secretary Wilson named Frank R. Creedon as special assistant to the Secretary of Defense to handle properties and installations matters. It had been common speculation in Washington that Creedon's name would be sent to the Senate for confirmation as Assistant Secretary of Defense for Properties and Installations.

Creedon plans to return to civil life in the near future.

Fatal construction mishaps surveyed

A California study of fatal accidents on construction jobs over a four-year period shows that falls were responsible for the largest percentage of deaths—33.6%—while cave-ins claimed 10.5% and 9.4% were killed by being run over by heavy equipment.

The survey, made by the California Industrial Relations Department's Division of Safety, found that laborers accounted for 28% of the deaths, carpenters, 10.6% and painters, 9.4%.

Fifteen percent of those killed met death while "waiting or standing" rather than while actually engaged in an operation. The second highest fatality rate, 11.8%, was attributed to these activities: handling, lifting, carrying or holding. Another 9.4% were killed while repairing, adjusting and assembling. Equally dangerous (9.4%) was operating machines.

The report lists as contributing causes of the fatal accidents: improper shoring, unguarded agency, low material strength, unsafe layout or traffic, and improperly stored tools.

An analysis of the report shows that 58.8% of the fatalities were attributable to the general construction phase. This figure does not take into account proportionate man-hour exposure.

Virginia toll road

Traffic survey is favorable to Richmond-Petersburg route thru both cities

The Virginia Highway Commission has been told there is sufficient traffic to justify construction of a toll road from north of Richmond to south of Petersburg. This would be roughly parallel to U. S. Route 1, a main artery to the South.

Findings favorable to the toll road project were made by Wilbur Smith & Associates, traffic engineers of New Haven, Conn., engaged by the commission to study both the Richmond-Petersburg route and a proposed Washington metropolitan area toll highway. A report on the latter proposal is not yet ready.

Two Richmond-Petersburg routes were studied. One would pass through Richmond and Petersburg close enough to serve also as traffic arteries within those cities. The other would be located entirely in rural areas.

The route through the cities is favored by the consultants. It would be 35.3 miles long and cost an estimated $57.2 million. Through Richmond, it would follow substantially the same route that was proposed last year by the New York consulting firm of Parsons, Brinckerhoff, Hall & Macdonald in a report to the Richmond Planning Commission as the best from the city's standpoint for a privately financed toll highway then under consideration.

Under Virginia's present turnpike law, the State Highway Department is barred from building toll highways through cities. Consequently, the traffic consultants also reported on a route around the two cities, which the department could build without a change in the act. That route would be 41 miles long and cost an estimated $51.3 million.

Construction of a four-lane highway is proposed, except in Richmond where six lanes would be laid.

Bridge dedication

An $8-million toll bridge spanning the Bay of St. Louis on Highway 90 in Mississippi will be dedicated Aug. 1. The four-lane, low-level crossing totals 10,189 ft in length. It consists of 239 reinforced concrete girder spans, each 41 ft long, on concrete pile bents; two 75-ft steel girder spans; and a 124-ft steel double-leaf bascule over the channel, providing 100-ft horizontal clearance between piers. Contractor is Merritt-Chapman & Scott of New York. U. S. 90 is main New Orleans to Mobile route along Gulf Coast.

N. Y. governor puts brake on measure for private Niagara power project

Opponents of the private enterprise bill for Niagara Falls power development appear to have halted its progress for this session of Congress.

With Washington lawmakers moving toward an early August adjournment, it is unlikely the Niagara legislation will get beyond the Senate Public Works Committee where it is now stuck.

New York Governor Thomas E. Dewey played the key role in putting the brakes on the bill which the House voted out by an overwhelming majority earlier this month (ENR July 16, p. 21.)

As it was voted by the House the measure would permit five New York electric companies to develop an additional 1.1 million kw of electric power at Niagara Falls. Cost of the project would be approximately $400 million.

• **Others speak up**—Dewey moved in as the Senate Public Works Committee was preparing to take a vote on the measure. He succeeded in getting hearings reopened and appeared as the first witness to push his own state development plan. This opened the way for federal development advocates to again present their case.

By this week at least five senators and congressmen were demanding to be heard on Niagara development before the committee closes its books. Senate committee members had earlier conducted joint hearings with the House on this legislation.

During his two-hour appearance before the Senate committee July 23, Governor Dewey made it clear he would use every means at his disposal to block the private enterprise development even if Congress should approve it.

He threatened to take court action on constitutional grounds—charging that the bed of the Niagara River and use of its waters is a state property.

Main point of Dewey's argument was that the state development plan would mean cheaper rates for Niagara power. He noted that private enterprise would have to pay more than $1.5 billion in taxes over a 50-year period in connection with operation of the proposed Niagara plant. This, of course, would be figured in the power rates.

• **In fighting mood**—Pointing to numerous other public water power developments, he continued, "if all water power in America paid federal, state, and local taxes I wouldn't have a leg to stand on. But why should my state be singled out to pay these taxes?"

Under the Dewey plan, Power Authority of the State of New York would build and operate the additional power plants at Niagara. The governor told the committee, "We don't ask Congress for a cent . . . all we ask is that you don't take away water power that is ours and turn it over to a private utility."

Dewey's fighting mood before the Senate committee came as a surprise to many lawmakers. The New York governor had made no private attempt to stop the private enterprise measure in the House.

There was one possible explanation: Dewey had wanted to have his hand on the St. Lawrence power project license before getting into the complicated Niagara fray. Federal Power Commission recently approved that license.

Now he is out to capture the second big power potential for his power authority.

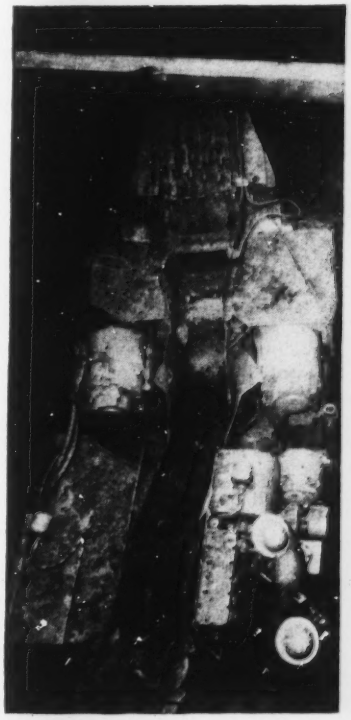
G. W. Bacon, engineering firm founder, dies

George Wood Bacon, 84, former chairman of the board of Ford, Bacon & Davis, Inc., New York City engineering firm, died July 21 in Pasadena, Calif. He helped to form the company in 1894, two years after being graduated from Cornell University as a mechanical engineer.

Among the firm's first jobs was the electrification of car lines in Millville, N. J., and New Orleans. From this work the company branched out into other fields—construction of power lines, bridges, tunnels, power plants, World War I munition plants and World War II atom bomb plants.

Mr. Bacon also served as vice-president of the United Railways Investment Co., president of the Sierra & San Francisco Power Co. and head of the J. P. Morgan & Co. export department.

Mining machine bores sewer tunnel



DIGGER STARTS TUNNEL from bottom of access shaft (viewed from surface).

Continuous tunneling, foreseen in 1948 when coal-mining machines first were put on the market, now is an accomplished fact in Euclid, Ohio.

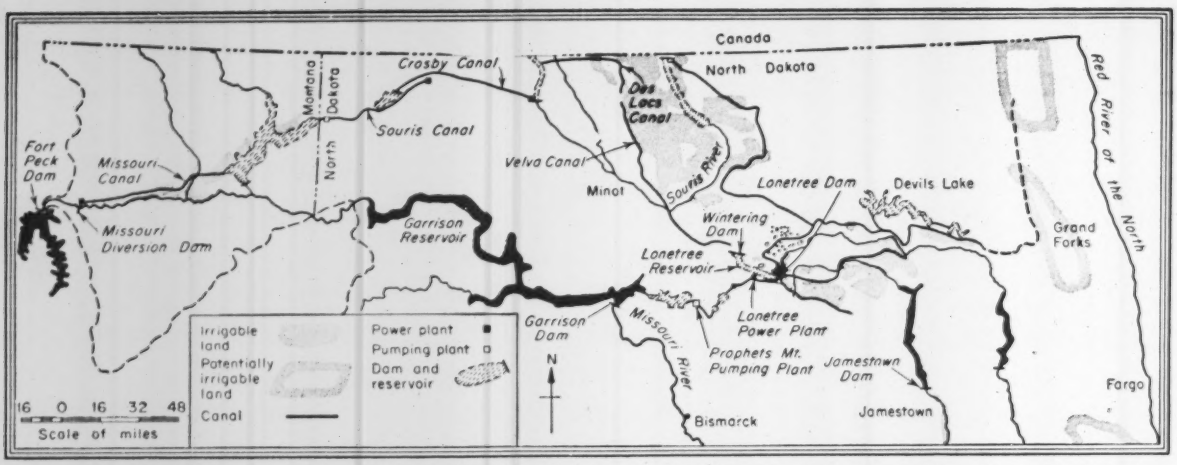
National Construction Co., Cleveland, put one of the diggers to work in a 4,000-ft sewer tunnel after residents' complaints stopped a routine drilling, blasting, and mucking operation.

The ground is medium-hard shale, comparable in digging characteristics to coal. Tunnel cross-section is 12 ft dia, with invert 40 ft below the surface. The digger makes about 10 ft in an eight-hour shift. Roof bolts protect the tunnel from cave-in.

Digger length is 25 ft; width, 7 ft. A chain-link cutter head with 136 teeth chews at the shale, feeding it to a conveyor that loads mine cars for rail haul to a shaft hoist. There will be eight access shafts in the Euclid sewer's 4,000-ft length.

Seven electric motors, totaling 186-hp, drive the digger; two for the cutter head, two for the conveyor, two for crawler traction and one for a water pump. Water is sprayed on the tunnel face during cutting, to keep down dust.

The digger is made by Joy manufacturing Co., of Franklin, Pa.



CHANGE IN PLANS—Because North Dakota land around Souris and Crosby Canals is not irrigable, these canals as well as Des Lacs canal will not be built. Souris Valley, which also was to benefit from Fort Peck diversion (left), now will get water from Garrison reservoir. It will be pumped over the divide at Prophets Mt. pumping plant, going to Lonetree reservoir and connecting canals.

Pick-Sloan plan's Missouri-Souris diversion plans to be revised

The proposed Missouri-Souris diversion scheme, one of the most ambitious projects in the Pick-Sloan plan, has been revised.

Originally, it was planned to take water from the Missouri River below Montana's Fort Peck Reservoir. This would have meant hoisting the water 90 ft over the watershed's divide and dumping it into the valley of the Souris, which loops from Canada into North Dakota, then back northward into Canada. The Gulf-bound water of the Missouri River thus would wind up in Hudson's Bay.

The revised Missouri-Souris project calls for taking water from North Dakota's Garrison Reservoir. According to Kenneth F. Vernon, regional director of the Bureau of Reclamation, Billings, Mont., construction costs of the Garrison plan have been estimated at $134 million less than for the Fort Peck plan. Furthermore, it is estimated that annual operation and maintenance costs would be $700,000 less.

The Garrison scheme would require 500,000 acre ft less water and only one-fourth as much main canal to reach the first large sections of irrigable land.

The Flood Control Act of 1944, which joined the Pick and Sloan (Army Engineer and Bureau of Reclamation plans, authorized Fort Peck diversion for the Bureau of Reclamation and Garrison diversion for the Army Engineers. Original Army Engineers plan called for diversion at Snake Creek, easternmost point of Garrison Reservoir. Now, the Bureau of Reclamation seeks to make the diversion there as part of the Garrison Dam project. Army engineers are well along toward completion of the Snake Creek diversion embankment.

Shift in plans came after investigation showed that about a million acres of North Dakota land proposed for the project are unsuitable for irrigation. The change also overcomes the problem posed by a Montana law which forbids exportation of water to another state.

However, North Dakota still has about a million acres suitable for irrigation elsewhere. Since this lies farther east and is at a lower elevation, Garrison was considered the best source of water.

As it now shapes up, the Garrison diversion includes not only Souris and other irrigation developments, but power production and water supply for about 40 municipalities. Raising the level of ever-shrinking Devil's Lake, dilution of seriously polluted streams and flood control would be additional benefits.

The Senate recommended $850,000 for advanced planning on Garrison diversion for fiscal '54. The appropriations bill, covering bureau work, however, has not yet received final action.

Construction of one unit common to both Fort Peck and Garrison plans will go ahead. That's the dam and reservoir at Jamestown, N. D. It is designed to safeguard the city from the recurrent and damaging floods that have beset it in the past. Irrigable land of the Jamestown project, however, will not be developed until additional water is available as a result of the Garrison diversion.

The Missouri diversion unit of the Missouri-Souris project continues to be an objective. It will put water on about 100,000 acres in Montana. However, construction of a dam below Fort Peck Dam to divert this water has been halted at the request of Congress to determine if pumps should be substituted for a diversion dam.

Firm and foreman fired for safety violation

In the first case of its type in California, the Stockton Construction Co., Inc. and foreman John Wiebe were convicted for safety violations which led to the death of a 62-year-old worker who was fatally injured when a ditch collapsed in Turlock Jan. 30.

Judge Harry O. Carlson fined the company and the forman $150 each for violating the state trench construction safety orders and the labor code.

State safety engineers have been ordered to require full compliance with shoring and bracing requirements, which specify that in hard compact soil, trenches more than 8 ft long and 5 ft deep must be adequately braced at intervals of not more than 8 ft. In some soils distances between braces must be much less—sometimes every foot of the way.

Pollution orders issued

The Wisconsin committee on water pollution and the state's board of health have issued 56 orders to communities and industries to cease polluting waters in 12 central and eastern Wisconsin counties.

Clean-up efforts are directed chiefly at the Wisconsin River and its tributaries and the Fox River and its tributaries (ENR July 9, p. 24).

Kansas River Basin

Municipalities will try to mediate the conflict in flood-control proposals

Kansas municipalities vitally concerned with Kansas River Basin flood-control measures will attempt to resolve the conflict between plans of the Army Engineers and proposals of a three-member board of consultants engaged by the State of Kansas.

The consultants have recommended a program of channel improvements and levees as a substitute for the federal government's comprehensive dam and reservoir program (ENR Mar. 5, p. 21, June 18, p. 25), even counselling a halt to construction of Tuttle Creek, Webster and Kirwin dams.

Army Engineer critics claim the consultants' program would cost more than the estimated $200 million and that the federal program involving 36 flood-control reservoirs and 21 local protection projects would cost nearer $700 million than the $1-billion figure used by the consultants (ENR April 23, p. 26). Among other things, they contend the consultants' flow-way proposals minimize the flood threat and fail to provide adequate protection for rural areas.

The city governments of Topeka, Manhattan and Lawrence, acknowledging their need for flood protection and asserting that federal funds will be necessary to pay most of the costs, have decided to form a committee to work for conciliation of the two plans.

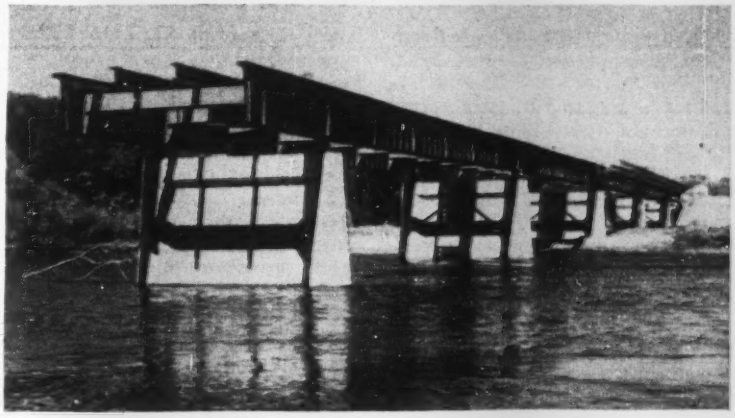
Officials of the three cities have invited all other incorporated Kansas municipalities in the affected area to send delegates to an organization and policy meeting that is scheduled for next week.

AISC sets rules for bridge competition

The American Institute of Steel Construction has set a Sept. 14 deadline for entries in its competition to determine the most aesthetic steel bridges opened to the public during 1952.

There are four contest classes: (1) bridges having one or more spans greater than 400 ft in length; (2) bridges with spans less than 400 ft and costing over $500,000; (3) fixed-span bridges costing less than $500,000; (4) bridges with movable spans. To be eligible, a bridge must be located within the United States or Alaska.

Winners will be selected by a jury of architects and engineers in the AISC office, 101 Park Ave., New York 17, N. Y.



Girder bridge continuous over eight spans

A welded steel bridge 1,134 ft long under construction over the Cedar River on U. S. 30 near Cedar Rapids, Iowa, will consist of two 117-ft and six 150-ft spans carrying a 28-ft roadway. Girders, 7 ft 10 in. deep throughout, were shop welded by The Allied Structural Steel Companies and made continuous over the piers. Composed of three plates, these members have 2-in. thick flanges tapering from a width of 28 in. over piers to 18 in. at splices. Cost of the bridge is $532,700, of which $267,400 is for structural steel ($294,600 was the low bid for riveting). Iowa Bridge Co., Des Moines, Iowa, is the general contractor. Howard, Needles, Tammen & Bergendoff, consulting engineers, Kansas City, Mo., designed the bridge.

Weather makes trouble in two regions

Extreme vagaries of weather were posing differing engineering problems in Texas and the Great Lakes area last week.

• **Too little**—In Texas, the problem was still not enough rain. Although a six-inch downpour had Abilene fighting off floods, West Texas, in general, was still largely drought-stricken. One Texan put the area's plight this way: "There's no use talking about one rain—what we need is a whole rainy season."

It is the fourth year of extremely low rainfall for much of West Texas, and state and federal governments are busily exploring relief measures. One federal contribution is the recently released study of Texas water problems by the Bureau of Reclamation (ENR July 23, p.24). State and local activities are more concerned with immediate relief than with long-range plans right now. Abilene, San Angelo, El Paso, Lubbock, Midland, Odessa, Big Spring, and West Texas, as well as Dallas farther east, have suffered great hardship and have had to curtail the use of water.

• **Too much**—In Great Lake states, too much rain is the problem. Weather Bureau reports out of Milwaukee say rainfall during the spring in the Lake Superior Basin was two to three times normal. As a result, the Corps of Engineers' Lake Survey this week is ordering all 16 of the control gates in St. Mary's River opened—gradually, so that the downstream flooding experienced last year will not be repeated. Lt. Col. W. N. Harris in Detroit says the lake is headed for a stage this month of 603.6 above sea level. This would about equal last August's level, the fourth highest mark in history.

Opening of St. Mary's gates will have a negligible effect on Great Lakes' levels downstream, it is claimed. Nevertheless, the survey points out that the Michigan-Huron unit is apparently headed for a 582.5-ft mark this year before it tapers off. That is only 2.5 in. less than its peak last year.

Turnpike broadcasts

Radio station WCMB in Harrisburg, Pa. is broadcasting five spot announcements daily to motorists using the 327-mile Pennsylvania Turnpike. Sponsor of the broadcasts, aimed at promoting safer driving and at educating motorists on regulations of the superhighway, is the state's turnpike commission. Beginning with the winter season, bulletins on weather and road conditions will be headlined.

Wages up 2.6% in building trades

Hourly wage scales of union construction trades workers rose 2.6% between April 1, 1953 and July 1, 1953 according to a quarterly survey released last week by the Bureau of Labor Statistics. Data, gathered from seven major trades in 85 U.S. cities, covers 585,000 workers.

Reflecting in part the general spring and summer contract reopening dates for the construction trades, scale increases were widespread in the three months ending July 1 and pushed the average hourly rate from $2.62 to $2.69 Upward adjustments were recorded for at least one trade in 79 of the cities studied. In about three-fifths of the cities, four or more trades registered gains; in one-eighth, all seven trades showed increases.

Estimated increases in union rates from April 1 and rate levels on July 1 in the 85 cities are shown below. In computing the average increase, the wage adjustments in each trade are applied to all workers in the trade.

	Average amount of increase: April 1, 1953 to July 1, 1953		Rate Levels July 1, 1953		
Trade	Percent	Cents per hour	Low	Average	High
Bricklayers	1.7	5.5	$2.50	$3.29	$3.65
Carpenters	2.7	7.3	2.05	2.81	3.40
Electricians	2.2	6.5	2.30	3.00	3.50
Painters	3.9	9.9	1.65	2.71	3.05
Plasterers	1.1	3.4	2.25	3.21	3.65
Plumbers	1.4	4.2	2.50	2.97	3.30
Building laborers	3.4	6.2	.90	1.87	2.59

71-day Kansas City teamsters strike settled; cost $20 million in wages

A 71-day-old teamsters strike which halted construction in Kansas City, Mo., ended last week when employers reached a wage agreement with the teamsters' union headed by O. L. Ring.

The strike which began May 11, involved over 1,000 teamsters, kept about 22,500 building craftsmen from their jobs in the city's metropolitan area, and cost more than $20 million in wages alone.

Principals in the final negotiation session were Ring and W. W. Hutton, secretary-manager of the builders' association. The heavy constructors' association still has to hold contract negotiations with the teamsters and hoisting engineers. However, Ring and heavy constructors' representative, James E. Burke, said they expect to conclude new contract terms immediately.

• **Voting**—After negotiating with Hutton and Burke for several hours, Ring called a special meeting of his union on July 20. Two wage proposals offered by the contractors were outlined—and voted down.

When the union refused the second proposal, Ring told members that Jackson County Circuit Judge Paul A. Buzard, who was attempting to mediate the strike, had proposed an alternative wage schedule. For nearly an hour the teamsters debated the new terms, then accepted them.

This wage agreement was the final hurdle to signing a new contract good until April 1, 1955. Here are the terms: (1) an immediate 10 cents an hour wage increase for ready-mixed concrete drivers and hard-materials drivers, plus an additional 2½ cents an hour to start April 1, 1954; (2) for other construction material drivers, principally lumber teamsters, an immediate 12½-cent hourly raise, with an additional boost of 5 cents an hour on April 1, 1954.

Four major contract changes were announced:

• The union recognizes that there will be no interference with free movement of material by or to any employer covered by the agreement, except refusal to cross a legal picket line approved by the teamsters, the Central Labor union, or the Building and Construction Trades Council of Kansas City.

• Stewards will not shut or slow down any job except when immediate safety is involved. Also the steward will be subject to the same terms of employment as any other employee, but nothing will prohibit him from performing union duties.

• If a dispute cannot be settled by negotiation (except a jurisdictional dispute), the contractor and union business representative will select an arbiter, and his decision will be taken as final.

• Questions of jurisdiction will be referred to the national joint board in Washington, and no work stoppage will result while such a decision is pending.

N. Y. skyscraper

New $45-million, 42-story structure will occupy an entire city block

The Manhattan sky line will have a new feature as a result of plans to construct a $45-million, 42-story skyscraper, which will occupy an entire city block near Grand Central Terminal.

To be named the Socony-Vacuum Building after its principal tenant, the structure is an enterprise of the Galbreath Corp., which has its headquarters in Columbus, Ohio. Socony-Vacuum offices will occupy about half the building.

The structure, containing 1.3 million sq ft of rentable floor space, will be the largest fully air-conditioned building yet constructed. It will have a marble facing to the fourth floor and brick-facing above. The first three floors cover the entire city block. Projecting above will be the tower rising to 42 stories, flanked by two sections up to the fifteenth floor.

Shops will occupy the first floor and also a concourse level. The second floor will provide 75,000 sq ft of office space, making it the largest single office floor of any building in the city. Offices will be equipped with acoustical ceilings and fluorescent lighting. The building will be equipped with 30 high-speed, electronically controlled elevators.

There will be a sub-basement garage for use of tenants. Pedestrian tunnels will connect with Grand Central Terminal, the subways, and other large buildings nearby.

The New York firm of Harrison and Abramovitz are the architects; Turner Construction Co., the contractor.

Site of the building will be the 83,000-sq-ft block, bounded by 41st and 42nd Streets and Lexington and Third Avenues. The block is now more than half occupied by a parking lot. Demolition of remaining buildings will begin in the fall. Construction will take about two years.

News briefs

• **Strike in Arizona**—The July 8 AFL strike of 350 bricklayers and 50 tile-setters has halted new construction in 11 Arizona counties. Since masonry is the state's standard form of construction, work on all new projects has been delayed pending possible contract wage revision. Present scale for bricklayers is $3.50 an hour. The union wants $3.75; the Arizona Masonry and Plastering Contractors' Assn. offer remains at $3.50.

• **Teamsters' troubles**—New York City's 1,200 striking sand, gravel and cement truck drivers met last week for the first time since the tie-up began July 3. City officials, attributing prolongation of the strike to inter-union strife, were hopeful that members would empower their negotiating committee to enter into an agreement. Up to now, AFL leaders have had no authority to act on any employer offer. Teamsters, asking for a $5 daily increase, turned down a $3 pre-strike proposal. More than 100,000 construction workers have been forced into idleness and work has been impeded on projects with a value $600 million.

• **Texas tie-up**—Approximately $100 million worth of large industrial construction in Houston, Texas City, Galveston and Freeport is practically at a standstill following last week's strike by three AFL labor unions. The 1,200 operating engineers, 800 ironworkers, and 180 sign painters involved are asking for an hourly wage increase of about 25 cents. Contractors have offered amounts ranging up to 12½ cents. In the Sabine area, some 2,160 carpenters began a walkout July 13 following breakdown of negotiations between the union and contractors' bargaining agents. Complete construction shutdown would idle about 35,000 workers in the area and cause an estimated weekly payroll loss of $5 million.

• **Gypsum plant**—Kaiser Gypsum Co., Inc., has authorized construction of a $4-million gypsum board plant and plaster mill in Seattle, to have a capacity of 100,000,000 sq ft of board products to supply Oregon, Idaho, Washington and Alaska.

• **Strike-bound St. Louis**—The 550 striking construction material truck drivers and 35 members of the Ready-Mix Concrete Dealers Assn. are still deadlocked in the dispute which has halted $75 million worth of construction and idled 27,000 workers in the St. Louis area. The strike began May 19 and no settlement has been in sight since collapse of city hall talks in mid-July the AFL teamsters' union wants an hourly boost of 15 cents the first year, 7½ cents the second; employers have offered 10 cents plus an additional 10 cents the second year.

• **Tax-exempt comeback**—Tax-exempt interest bonds of local governments are continuing a comeback from the low prices of the spring. The rise in yields to levels that are highest in 14 years is apparently attracting individual investors previously out of the market because yields from the bonds were too scanty.

• **Tax write-off**—The Office of Defense Mobilization last week granted 177 new rapid-tax-amortization certificates for expanded production facilities, for amounts totaling $206 million. The new grants bring total since the program started to 17,601—for a total of $27.5 billion worth of new facilities.

• **Homebuilding up in N. Y.**—Private homebuilding in New York State increased 7% in June, 1953 over the same month a year ago. The figure includes 7,986 new private housing units.

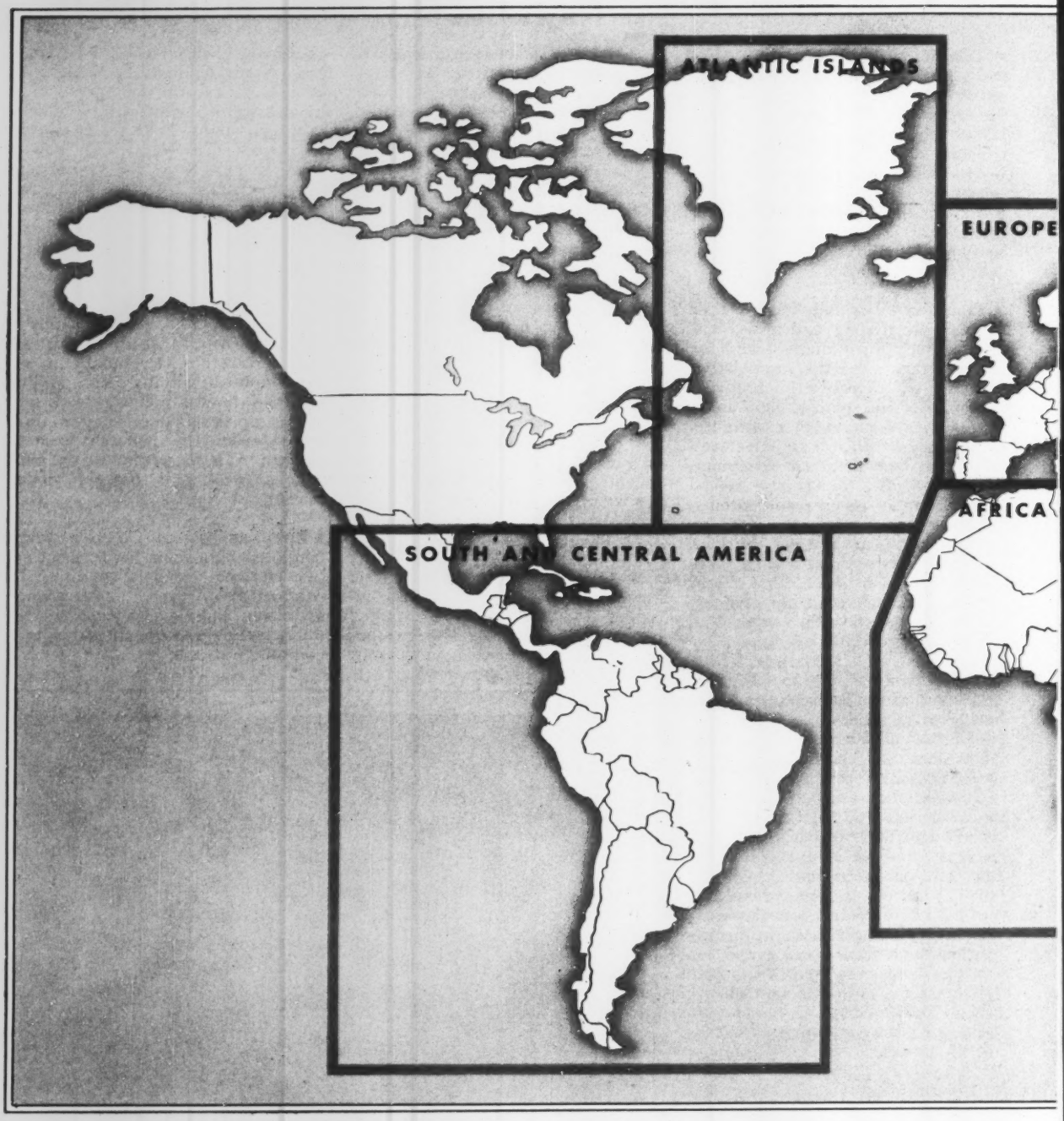
• **Baltimore beltway**—The Maryland State Roads Commission soon will ask bids for construction of the first five-mile leg of the 30-mi, $39-million Baltimore County Beltway. It will be the stretch between Dulany Valley Road and Falls Road, a section of the beltway that will tie in with the new Baltimore-Harrisburg expressway. When completed the beltway will extend from the Washington Boulevard to the Pulaski Highway.

• **Pollution order**—Ohio's State Water Pollution Control Board has set a deadline of Sept. 8 for firms operating blast furnaces to file application for waste disposal permits. This is the first step toward bringing blast furnaces, which produce a flue dust waste, under the pollution control program. The steel industry's phenolic wastes were brought under control last April.

• **River compact**—A Colorado River boundary commission has been set up by California to draft an interstate compact with Arizona to settle boundary claims and an agreement on carrying out projects to straighten and control the stream.

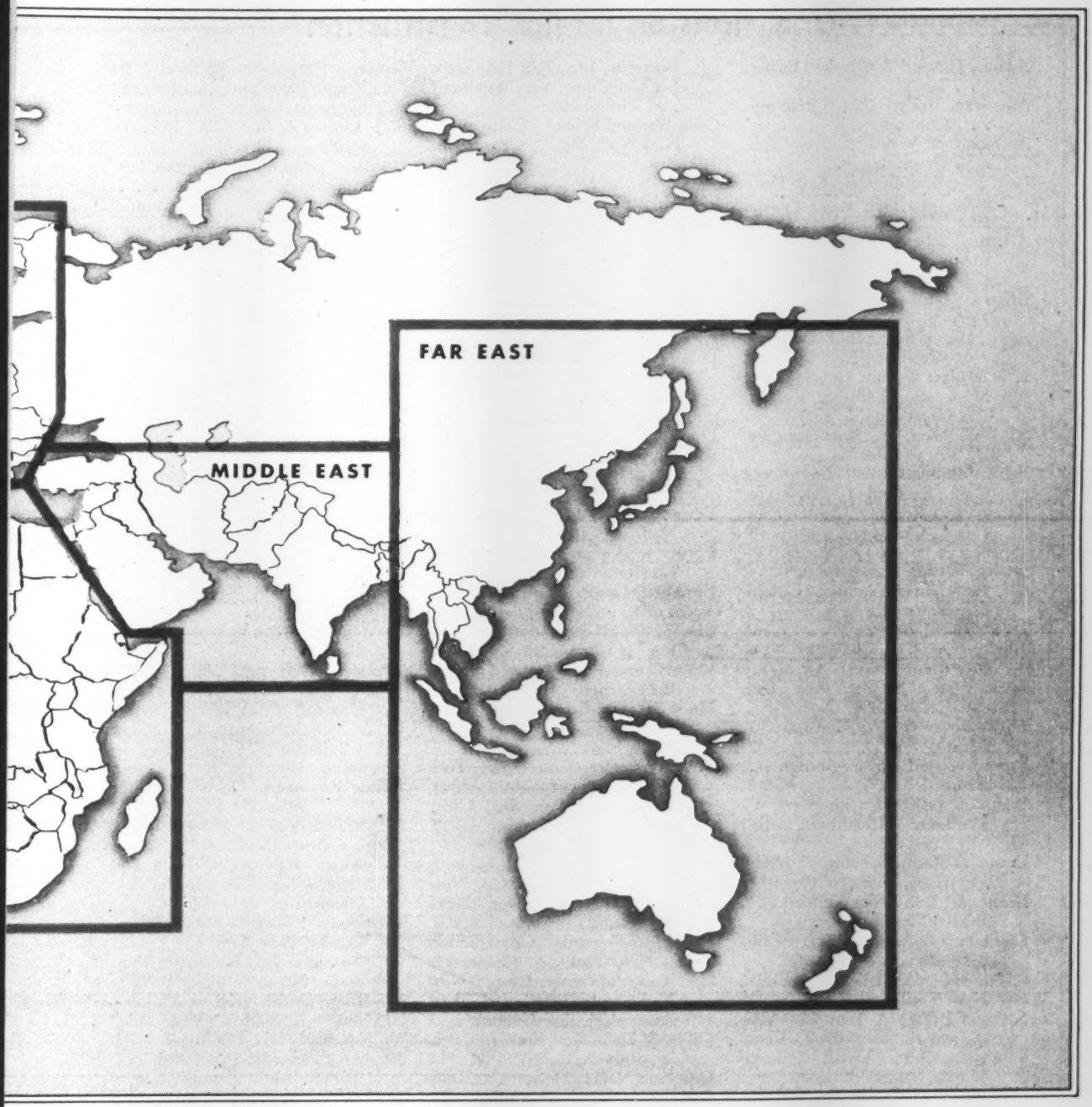
Wide World photo

SPENCER J. MILLER, JR. (left), former member of the New Jersey State Highway Commission, receives congratulations from Secretary of Labor Martin Durkin (right) after being sworn in as Assistant Secretary of Labor as Sen. H. Alexander Smith of New Jersey looks on. Miller has been president of the American International College at Springfield, Mass.



U. S. Construction Overseas

Special report on the activities of American engineers and contractors on jobs spread round the world



SINCE Panama Canal days there has always been a segment of the American construction industry that considered jobs in foreign lands to be within its province of interest and action.

Allied with international bankers, sometimes with the aid of manufacturers and producers of equipment and materials, frequently spurred by the promise of adventure, these builders focussed their attentions mainly on Central and South America—but also found work to do in such diverse places as Greece, England, India and Japan.

Until the shadows of World War II began to gather, this was a small and select fraternity, whose activities caused scarcely a ripple in the main current of affairs of construction which was concerned with building—and rebuilding—America.

But suddenly American engineers and contractors began to appear in all manner of distant places, doing all manner of jobs. First came the outpost islands of the Pacific, then the Caribbean Islands, and next Newfoundland, Northern Ireland, Africa and the Middle East. England followed, then China, India, Burma—and finally France and the Continent of Europe.

Either as consultants, contractors or members of the armed forces, American construction men became world-minded in droves. They sensed the useful facilities that their construction management and methods could

U. S. firms on foreign construction

Adams, Howard & Greeley, Boston . . . India
American Bridge Co., Pittsburgh . . . Colombia
Ammann & Whitney, New York . . . Bermuda, France
Guy F. Atkinson Co., San Francisco . . . Japan, Philippines, Italy
Atlantic Engineers, New York (Ammann & Whitney, Guy B. Panero) . . . France
Atlantic Gulf Pacific Co., New York . . . Venezuela
Ayres, Hagen & Booth, Providence, . . . Newfoundland
E. P. Badger & Sons (subsidiary of Stone & Webster, Boston) . . . Great Britain, France
Michael Baker, Jr., Rochester, Pa. . . . Arabia, Jordan
Bank Builders & Equipment Corp., St. Louis . . . Honduras
Bates & Rogers Construction Corp., Chicago . . . French North Africa
Bechtel Corp., San Francisco . . . Philippines, Arabia, Colombia, Venezuela
H. C. Beck, Atlanta . . . Iceland
Blythe Bros. Co., Charlotte, N. C. . . . French North Africa
Buck, Seifert & Jost, New York . . . Colombia
H. E. Bovay & Co., Houston . . . Mexico
Bowers & Barbalas, Pittsburgh . . . Azores
Braun Transworld (subsidiary, C. F. Braun, Alhambra, Calif.) . . . Australia
Brown & Root, Houston . . . Mexico, Haiti, France
Burns & Roe, New York . . . Brazil, Greece
Capital Engineering Co., Dillsburg, Pa. . . . Bermuda
Chemical Construction Corp., New York . . . Israel
Chicago Bridge & Iron Co., Chicago . . . Greenland, Venezuela, Iraq, Arabia, Bahrein Islands, Trinidad
Condon-Cunningham Co., Omaha . . . Greenland
Construction Aggregates Co., Chicago . . . Israel
Contractors Mid-Pacific (Hawaiian Dredging Co., Honolulu; J. H. Pomeroy, Inc., San Francisco; Bechtel Corp., San Francisco) . . . Philippines
Crow-Shepard-Steers Companies, New York (W. I. Crow Construction Co., New York; J. Rich Steers, New York; Shepard Construction Co., Atlanta) . . . Lybia
Richard Hawley Cutting Associates, Cleveland . . . England, France
Daniel, Mann, Johnson & Mendenhall, Los Angeles . . . France
Drake-Merritt, New York (Johnson, Drake & Piper and Merritt-Chapman-Scott Corp.) . . . Labrador
Dravo Corp., Pittsburgh . . . Brazil
Ebasco Services Inc., New York . . . India, Brazil, Peru, Cuba, Italy, Greece, Japan
Edwards, Kelcy & Beck, Newark, N. J. . . . Iraq
Eggers & Higgins, New York . . . Newfoundland
Elmhurst Construction Co., New York . . . Santo Domingo
Fay, Spofford & Thorndike, Boston . . . Labrador
Fluor Corp., Los Angeles . . . Arabia, France
Foley Bros. Construction Co., Pleasantville, N. Y. . . . Brazil, Chile
Foster-Wheeler Co., New York . . . Union of South Africa, Philippines, Colombia, Great Britain, France, Italy
Foundation Co., New York . . . Greece
Fraser-Brace Engineering Co., New York . . . Labrador, Newfoundland.
Gahagan Overseas Construction Co., New York . . . Venezuela
Gai Pan American Corp., New York (subsidiary of Gilbert Associates) . . . Colombia
Gibbs & Hill, New York . . . Brazil, France, Italy
Giffels & Vallet, Detroit . . . Italy
Gilbert Associates, Reading, Pa. . . . Italy, France
Frank Grad & Sons, Newark, N. J. . . . Newfoundland, France
Greeley & Hanson, Chicago . . . Brazil, Colombia, Panama
Grove, Shepherd, Wilson & Kruge, New York . . . French Morocco, Greece, Philippines
S. J. Groves & Sons Co., Minneapolis . . . Greenland
Gordon Hamilton Contracting Co., Kansas City, Mo. . . . Iceland, Turkey, Newfoundland
Hamilton Overseas Construction Co. . . . Turkey
Harland Batholomew & Associates, St. Louis . . . Pakistan
Frederick R. Harris, Inc., New York . . . Newfoundland, Venezuela
Harza Engineering Co., Chicago . . . Philippines, Iraq, India, El Salvador
Hawaiian Dredging Co., Honolulu . . . Japan, Philippines
Hazen & Sawyer, New York . . . Liberia
Wyatt C. Hedrick, Fort Worth, Texas . . . Iceland
Alfred Hopkins, New York . . . Greenland
Irons & Reynolds, New York . . . Azores
Al Johnson, Minneapolis . . . Greenland
Johnson, Drake & Piper, New York . . . Guatemala, Cuba, Greece
J. A. Jones Construction Co., Charlotte, N. C. . . . El Salvador, Honduras
Kaiser Engineers, Oakland, Calif. . . . Jamaica
M. W. Kellogg Co., New York . . . Australia, Union of South Africa, Italy, Great Britain
Peter Kiewit Sons Co., Omaha . . . Greenland, Venezuela
Knappen - Tippetts - Abbett - McCarthy, New York . . . Lybia, Mozambique, Southern Rhodesia, Burma, Korea, Turkey, Iraq, Brazil, Bolivia, Colombia, Ecuador, Venezuela, Haiti, Greece, Portugal
Koppers Company, Pittsburgh . . . Turkey, India, Brazil, Chile
Kuljian Corp., Philadelphia . . . India, Pakistan, Italy
Lessels & Associates, Boston . . . Brazil
Litchfield, Whiting, Panero, Severud & Associates, New York,

provide for foreign lands— and as war devastation reduced to tragic proportions even the inadequate physical facilities of pre-conflict days, they generated something akin to missionary zeal to replace them.

More encouragement came with the outpouring of U. S. government funds —first to strengthen the wartime allies, economically then to help build up their military strength. Having cut their foreign work eye-teeth in preparing for and fighting one war, U. S. construction people found themselves still at work in a feverish attempt to prevent another.

• **World power—world job**—Thus—partly through chance and partly from choice, and in some measure, from duty—the American construction in-

U. S. firms on foreign construction

(Alfred Hopkins & Associates, Edmund J. Whiting, Guy B. Panero, Severud-Elstad-Krueger) . . . Burma

Arthur D. Little, Inc., Cambridge, Mass. . . . Egypt

Lock Joint Pipe Co., East Orange, N. J. . . . Israel, Santo Domingo

Lockwood, Kessler & Bartlett, Inc., New York . . . Colombia

Lummus Co., New York . . . India, Venezuela, Great Britain, France

Macco-Pan Pacific Co., Los Angeles . . . Bolivia, Venezuela

Mackenzie, Bogert & White, New York . . . French Morocco, France

Madigan-Hyland, New York . . . Colombia

Charles T. Main, Inc., Boston . . . Turkey, Colombia

Marsman Construction Co., San Francisco . . . Philippines

Mayer & Whittlesey, New York . . . India

McDonald Engineering Co., Chicago . . . Peru

McDowell Co., Cleveland . . . Venezuela

Arthur G. McKee Co., Cleveland . . . Brazil, Colombia, Mexico, Italy

McNally Pittsburgh Co., Pittsburg, Kansas . . . Turkey

McWilliams Dredging Co., New Orleans . . . Venezuela

Merritt-Chapman-Scott, Inc., New York . . . New Zealand, Labrador

Metcalf & Eddy, Boston . . . Greenland

Metcalfe Construction Co., Kansas City, Mo. . . . Iceland, Newfoundland, Turkey

Metcalfe-Hamilton Companies, New York (Metcalfe Construction Co., Kansas City, Mo., Gordon Hamilton Contracting Co., Kansas City, Mo.) . . . Newfoundland

Metcalfe - Hamilton - Smith - Beck Companies, Richmond, Va. (Metcalfe-Hamilton Companies, New York, Smith Engineering Co., Pensacola, H. C. Beck, Atlanta) . . . Iceland

Ralph L. Mills Co., Inc., Durham, N. C. . . . French North Africa

Nathan A. Moore Co., Los Angeles . . . Colombia

Morrison-Knudsen Co., Inc., Boise, Idaho . . . French North Africa, Australia, New Zealand, Turkey, Afghanistan, Ceylon, Brazil, Colombia, Peru, Venezuela, Mexico, Guatemala

North Atlantic Constructors (Peter Kiewit Sons Co., Omaha; S. J. Groves & Sons Co., Minneapolis; Condon-Cunningham Co., Omaha; Al Johnson, Minneapolis) . . . Greenland

O'Connor & Kilham, New York . . . Newfoundland

Oscar Van Kohorn & Co., Ltd., New York . . . Philippines

Pacific Bridge Co., San Francisco . . . Peru

Pan American Engineers & Constructors, New York . . . Ecuador

Guy B. Panero, New York . . . France, Burma

Parsons, Brinckerhoff, Hall & Macdonald, New York . . . Newfoundland, Turkey, France, Bahrein Islands

Pitometer Co., Inc., New York . . . Colombia

J. H. Pomeroy, Inc., San Francisco . . . Philippines

Porter & Urquhart, Newark, N. J. . . . French North Africa

Praeger-Maguire, New York . . . Newfoundland

Preload Co., Inc., New York . . . New Zealand, France, French North Africa, Brazil

Ralph Parsons & Co., Los Angeles . . . Turkey

Raymond Concrete Pile Co., Inc., New York . . . Liberia, New Zealand, Colombia, Venezuela, Cuba, France

Antonin Raymond & L. L. Rado, New York . . . Azores

Roberts & Schaefer Co., New York . . . Cuba

John L. Savage, Denver . . . Australia, India

Seelye, Stevenson, Value & Knecht, New York . . . Labrador, Newfoundland, France

Shreve, Lamb & Harmon, New York . . . Labrador, Newfoundland

Skidmore, Owings & Merrill, New York . . . French North Africa

Smillie & Griffin, New York . . . Venezuela

A. C. Smith Co., Milwaukee . . . Brazil

Smith Engineering Co., Pensacola . . . Iceland

Harold T. Smith, Inc., Washington, D. C. . . . India, Ecuador, Peru

Frederick Snare Corp., New York . . . Azores, Turkey, Colombia, Peru, Cuba

Southwestern Engineering Co., Los Angeles . . . Turkey

Standard Dredging Corp., New York . . . Venezuela, Guatemala

Starr, Park & Freeman, New York . . . Greece

J. Rich Steers, Inc., New York . . . French Morocco, Greece

Stone & Webster, Boston . . . Turkey, Brazil

Nello L. Teer Co., Durham, N. C. . . . French North Africa

Texas-Tellepsen Construction Co., Houston . . . Mexico

Thompson-Starrett Co., New York . . . Turkey

R. J. Tipton, Denver . . . Colombia, Venezuela

Tucker McClure, Inc., Los Angeles . . . Ecuador

Utah Construction Co., San Francisco . . . Australia, Colombia, Peru

Vacuum Concrete, Inc., Philadelphia . . . France, Italy, Egypt, Spain

Walsh Construction Co., Davenport, Iowa . . . France

Paul Weir, Pittsburgh . . . Turkey

Western Knapp Co., San Francisco . . . Turkey

J. G. White Engineering Corp., New York . . . Formosa, Indonesia

W. Horace Williams Company, New Orleans . . . Suriname

Dwight Winkleman Co., Syracuse . . . Cuba

Winston Brothers Co., Minneapolis . . . Colombia

dustry developed into a world power. And no longer does only a small segment of the larger group consider the foreign field its baliwick.

Take it on any basis you like—you still get an enormous total when you add up the contribution this power has made to the recovery and progress of the world since the end of World War II.

Overall, the United States has opened its purse to the tune of something like $30 billion for aid to the rest of the world since 1946. Of that total, construction can account for more than $9 billion.

In the solid, tangible products of their craft—in brick and steel and stone and wood—America's engineers, architects, contractors, manufacturers have tied backward countries together

with the strong ties of passable roads, railroads, good airports, canals, ports and harbors. They've aided in cleaning up areas of the notoriously insanitary East; helped bring water to parched areas of the earth; built factories and offices and housing.

Their jobs have ranged and are ranging from cleaning out almost prehistoric water-catchment basins in the Garden of Eden to huge power and irrigation programs in South America.

They've turned their talents to give advice in planning. They've surveyed such disparate places as Afghanistan, Brazil, Japan, Turkey, Greece and Liberia to help local governments find out what exists there, how resources can best be turned to the benefit of the country concerned. Along with vast new discoveries of oil and mineral wealth have come construction men to help move these resources to the world's uses and markets.

• **No easy job**—It hasn't been easy, and it isn't easy now.

Strange places and strange customs and strange peoples and laws have posed problem after problem. It has been a hard lesson to many an American that he must adapt his techniques to native ones, rather than remake everything into his own pattern.

Not the least of the trouble has arisen from native distrusts of foreigners (somewhat dispelled though, during World War II). And many a country, in its attempts to protect its own nationals and out of pride, has imposed laws so restrictive as to rule out most foreign competition.

Biggest trouble of all has been money—good, hard American money. The wobbly political situation in many lands, tied to abnormal conditions of a postwar world that is only nominally at peace, have upset any previous balance of trade and currency exchange that might have been counted upon. New nations emerging from the chaos of the war, and older nations not yet recovered, have found it difficult to keep their money on an even keel—and have gone to peculiar limits to keep what currency they have within their own borders. So dollar payments to Americans in most places (unless backed by one of the two world banking organizations) are always difficult, and it is frequently impossible to get the money home.

• **The money**—The money that's being spent comes from many sources: some from private capital both at home and abroad; some from the foreign governments concerned.

Biggest sources are three:

The International Bank for Reconstruction and Development (World Bank); the Mutual Security Agency, and the Export-Import (Ex-Im) Bank.

The World Bank was set up at Bretton Woods to encourage basic economic development in member countries which could not obtain long-term financing elsewhere. Each of 51 member governments put up a share of the bank's original capital, partly in gold or dollars and partly in local currencies—each government contributing shares on a basis of ability to pay (thus the U.S. put up the biggest share). Subsequently, the bank has floated several bond issues to provide itself with capital.

Theoretically, World Bank can make loans in any of the currencies of member countries, but in practice most of its loans have been in dollars. Almost all projects have been basic developments in the fields of power, transportation, and agriculture.

MSA is the successor agency to the Economic Cooperation Administration that was set up to handle foreign aid under the Marshall Plan. MSA gives direct dollar grants to foreign countries for mutually-agreed-upon projects, operating in Europe, European dependencies, Southeast Asia and the Far East.

Ex-Im bank makes loans designed to further U.S. national interests. Originally these loans were supposed to encourage U.S. trade objectives—particularly U.S. exports. But in the postwar period, many loans have been made for frankly political reasons, and for balance of payment purposes.

A fourth agency—the Technical Cooperation Administration (TCA)—is a branch of the U.S. State Department that administers dollar grants made to the Near East, India, Pakistan, Ceylon, Nepal, Afghanistan, parts of North Africa and Latin America. The "technical assistance" consists for the most part in exporting U.S. know-how in the form of experts, pilot plants, demonstration projects and technical surveys, mostly in the fields of public health and agriculture.

(MSA and TCA are slated to be merged into a single Foreign Operations Administration under a reorganization plan now before Congress.)

Together, these agencies have accounted for most of that conservatively-estimated $30 billion the U.S. has sent abroad. To what has been thus supplied, of course, must be added the contributions of the foreign governments—and to get a true picture, it would be necessary to add up the expenditure of money generated by these funds in the form of local work, wages, trade.

• **And the manufacturers**—One important segment of the construction industry—the manufacturers of materials and equipment—deserves a special low bow for its pioneering work.

Sometimes ahead of the rest of the industry, sometimes right along with it, the manufacturers have gone to great effort to teach the use of their machines, and the uses to which the machines can be put. Their efforts range from special training of salesmen in the fields of foreign languages, customs and currencies and laws, to transporting machine operators and their machines to many a remote spot—not to amaze the natives, but to show them how to run the equipment.

They have set up parts distribution centers in many places in the world, set up schools for local mechanics, arranged financing and credit, assisted native contractors in setting up plants on the job, printed mountains of booklets and other matter in most of the languages of humanity to help in the maintenance of their machines.

Materials manufacturers have done the same. One important effect of their work has been the realization for many of the nations of the advantages and even necessity of high standards of performance and quality, and of integrity by business concerns. (See p. 127 for details on machinery and materials exports.)

• **And the record**—Because the job has been so big, and so scattered, and because construction men have been moving too fast to worry about it, there's been no attempt, up to now, to put down even part of the record. The editors of ENGINEERING NEWS-RECORD think it well worth the attempt—hence this issue.

When you deal with the whole world—and try to do it within the confines of a limited number of printed pages—there are certain arbitrary decisions you must make. One of these was the division of the world into the six zones shown on the opening map.

Another was the decision to leave out of this general discussion Canada and U.S. possessions and territories off the mainland. We are well aware, of course, of the tremendous amount of construction our neighbors to the North have done and are doing—and of the great part being played in it by U.S. constructors. The same would apply to the vast military and other works afoot in the U.S.'s own areas overseas. But methods in Canada, and in Alaska, Hawaii, Puerto Rico, the Virgin Islands, are very close to our own, the currencies and customs so similar as to be almost identical.

So here, then, follows the record—not guaranteed to be complete in detail, but certainly complete in scope—that an industry has made.

SOUTH and CENTRAL AMERICA: Old and Big Market

More U. S. engineers and contractors have operated in Latin America than in any other region of the world. Before World War II there was plenty of competition from other foreign builders—German, British and Dutch in particular—and although this situation may be repeated again, U. S. technical services hold an impressive preferred position at present.

Right now, U. S. contractors, equipment, and engineers are working in almost every country in Latin America. And they haven't begun to sate the market—Latin America presents one of the most likely areas in the world for future construction. Specifically, there are good prospects for work in Colombia, Peru, Venezuela, and Brazil—all countries that are comparatively solvent. About the only major concession U. S. firms must make in these countries—and it is often to their own advantage—is to hire a specified quota of native labor and engineers on their projects.

Of course, doing business in Latin America is not the same in all countries. In Argentina, for instance, restrictive business regulations limit the construction field to Argentine firms. U. S. firms have worked in Argentina in the past, but there have been none there in five years. On the other hand, Peru and Venezuela have no business restrictions against U. S. firms working

CONSTRUCTION WAGES PER HOUR IN NATIONAL CURRENCY

City	Exch. rate June '53 per $1 US	Common Labor Hvy. constr. 6/53	Common Labor Hvy. constr. 6/52	Building 6/53	Building 6/52	Bricklayers 6/53	Bricklayers 6/52	Carpenters 6/53	Carpenters 6/52	Structural Ironworkers 6/53	Structural Ironworkers 6/52
Bogota, Colombia[af]	2.50 pesos	0.97	0.50	0.79	0.50	0.97	0.75	1.12	0.75	1.28	1.00
Buenos Aires, Argentina[ad,ft]	14.00 pesos	35.47	35.47	35.47	35.47	40/42/44	40/42/44	44.55	44.55	.....	.....
Caracas, Venezuela[ac,h]	3.35 Bolivars	11.00	12.00	10.00	10.00	21.00	21.50	21.00	21.50	21.00	21.50
Ciudad Trujillo, Dom.Rep.[ah]	RD $1.00	1.50	.....	1.50	.....	4.50[p]	.....	3.50/4.50	.....	[i]	[i]
Guatemala City[ah]	1 quetzal	0.80[4]	.....	0.80[4]	.....	1.30	.....	2.00	.....	1.35	.....
Lima, Peru[ae]	16.50 soles	18.22	.....	18.22	.....	30.51	.....	30.51	.....	30.51	.....
Mexico City[ae]	.....	1.25	0.83	1.06	0.83	2.25	2.20	2.25	2.20	1.88	2.20
Quito, Ecuador[ap]	17.35 sucres	1.28	.....	1.28	.....	2.90	.....	3.00	.....	0	.....
Rio de Janeiro, Brazil[e]	20 cruzeiros	8.5[b]	7.5[b]	6.0[e]	5.5[e]	12.00	11.00	12.00	11.00	13.00	12.00
Santiago, Chile[ae]	110 pesos	16	12-14	13	11-12	22	18-18	24	20-22	22	16-18

[a] 8-hr day [b] advanced labor (adjudante) [c] common labor (servant) [d] 44-hr wk [e] 48-hr wk wages incl extra day's pay for working 46 hrs per wk. Contractor pays 10% more for payroll taxes and insurance this increases to 12.5% on 12/31/53 [f] plus 80% to cover insurance and other social charges [g] actual labor costs higher since worker paid 7 days, works 6, gets 15 days' pd vacation [h] per day [i] includes additional 46% over base rate to cover insurance, pd holidays and other social charges pd by contractor [j] includes mark-upfor social insurance, and other employer contributions. 30% in 6/52; 44% in 6/53 [k] 19.55 per paper bag, delivered [l] work done by other trades [m] includes social insurance, unemployment, indemnity reserve, vacation and other direct taxes pd by employer, amounts to about 73% of common rate; 66% of skilled rate [n] pd 7days, work 6, hrly wage rate not adjusted for extra day [o] pd 25-40 sucres per 100 lb erected. Higher rate pd those who bend and place [p] masons

Ranges [A] 0.60–0.80

CONSTRUCTION MATERIALS PRICES IN NATIONAL CURRENCY, F.O.B. CITY, JUNE '52 AND JUNE '53

City	Structural steel per ton 6/53	Structural steel per ton 6/52	Reinf. steel per ton 6/53	Reinf. steel per ton 6/52	Portland cement per ton 6/53	Portland cement per ton 6/52	Lumber 2 x 4 s4s per M ft bm 1st class pine 6/53	1st class pine 6/52	2nd class pine 6/53	2nd class pine 6/52	Local equivalent 6/53	Local equivalent 6/52
Bogota, Colombia	1,000[a]	700[a]	550[a]	615[a]	77[a]	77[a]	1.30[a]	.....	.....	.....	4.50[aa]	.....
Buenos Aires, Argentina	2,500[a]	2,500[a]	2,300[a]	1,800[a]	391[ad]	284[a]	25/27[bb,a]	22[bb]	23[bb,a]	18[bb]	24/25[bb,a]	22[bb]
Caracas, Venezuela	650[ac]	600[ac]	480[a]	600[ac]	110[ac]	150[ac]	.....	.....	.....	.....	270[bb]	260[bb]
Ciudad Trujillo, Dom. Rep.	.....	.....	7.25/7.50[a]	.....	1.45[a]	.....	.....	.....	.....	.....	110-120	.....
Guatemala City	none used		8.35[a]	.....	1.25[a]	.....	0.07[aa]	0.065[aa]	.....	.....	.....	.....
Lima, Peru	.....	.....	.....	.....	13.12[bb]	.....	2.50[ac]	.....	.....	.....	.....	.....
Mexico City	1224.23[ae]	193.63[ae]	1353.14[add]	1327.74[add]	160.00[a]	160.00[a]	1350	1400	1100	1100	750[a]	850[a]
Quito, Ecuador	220.00[a]	.....	not used	not used	32.00[a]	.....	.....	.....	.....	.....	4.50[b]	.....
Rio de Janeiro, Braz.	7,500[a]	7,200[a]	10,000[a]	6,000[a]	936[aa]	800[aa]	3.60[af]	3.70[af]	2.45[af]	2.50[af]	.....	.....
Santiago, Chile	50,000[a,4]	27,000[a]	20,430[aa]	17,800[aa]	2,867[aa]	23,44[aa]	20,400	16,000[a]	10,100[f]	8,000[f]	9,800[af]	800[af]

[a] per metric ton, 2204.6 lb [b] Eucalyptus 12 cm x 18 cm 1 meter up to 5 meters. Longer lengths add 15% [c] per cu ft [d] or equivalent [e] per meter [f] per sq ft [g] Alamo poplar [h] per sq meter, 1-in. thick [i] fob mill [j] per cu meter [k] Saqui Saqui [l] 1-in. x 10 in. [m] 30 tons or more [n] 3 x 4 in. spruce [o] 1 x 6 in. spruce [p] 1 x 12 in. spruce [q] black market: 6/53, 1500 cr; 6/52, 1280 cr. per ton. [r] fabricated, ready for erection. Single beams, girders: 4,800 cr/metric ton. [s] oak [t] 19.55 p per paper bag, delivered [u] very little around [v] seldom used. Balsa used for scaffolding in some cases, used wood in others. [w] Mexican Sacred Fir Oyamel [x] per 42.5 kg sack [y] 3-in.–15-in. x 12 meters [z] per 100 lb [aa] rough, per bd ft. [bb] per 42kg sack [cc] Oregon, per bd ft [dd] ¾-in. x 11 meters

Ranges [A] 45,000–50,000

SULFIDE PLANT high in the Andes Mountains in Chile is one of the largest single projects in South America.

within their oil-and-ore-rich borders.

Financing of construction, or import of equipment into Latin America, is also a confused picture: Argentina presumably is a market for U.S. machinery since there are no import restrictions, yet native firms must go through an extremely lengthy process of showing the government where they will get dollars to pay the American manufacturers. Again Peru and Venezuela offer no undue obstacles to imports of either capital or equipment.

Most Latin American countries need construction equipment and can pay for it, either from their own funds or out of loans from the Export-Import Bank, or the World Bank. Colombia, Mexico, Venezuela, and Brazil all have markets for construction equipment—and their payments are prompt.

• **So much work** is under way—under varying conditions—that a country-by-country tabulation must be made in order to get a rounded picture:

▸ Brazil

There are a good many U.S. consultants and contractors working in this largest of South America's nations, despite the admitted difficulties of securing contracts and carrying them out.

No legislation is specifically aimed against U.S. firms, but Brazilian labor and wage laws necessitate so much reorganization of a company's operating procedure that the initial integrated efficiency of American firms must sometimes be sacrificed to get work. It must be considered, too, that the Brazilian government acts as a somewhat prejudiced final board of appeal in almost all contract awards and settlements.

Financing is precarious, unless participated in by an organization such as the World Bank. Otherwise contracts may be made and then only permitted to proceed to the extent of funds actually available—usually a losing proposition for engineers and builders.

Contracting work also frequently turns out to be more expensive than comparable work in the U.S. because of inefficient labor and time lost in repairs, maintenance, and the shipment of materials.

UNDERGROUND POWER PLANT in Brazil is being carved out of solid rock.

It is a necessity for a U. S. firm to hire a Brazilian engineer as the nominally responsible head for carrying out the operation.

But in spite of red tape and grievances, which have little chance of being righted, there are quite a few firms with good toe-holds in Brazilian construction.

Power projects

• Morrison-Knudsen Company, Boise, Idaho, is building a $90-million underground power plant at Riberrao das Lajes, 50 miles from Rio de Janeiro. The first part of the project involved diversion of the Paraiba-Pirai River (1952). The power plant is now being carved out of solid rock.

Cubatao, above Santos in the State of Sao Paulo, is the site of another underground power plant, also being built by M-K.

In the state of Minas Gerais, M-K is also the contractor on a $15-million hydro job at Itutinga Falls, on the Rio Grande, with transmission lines to provide electricity for 17 municipalities. And in this same area, M-K is working on the $2-million Cajaru dam to serve as a storage reservoir for an existing power plant.

Finally at Paulo Afonso Falls, M-K is constructing a $55-million power plant and 150 miles of transmission lines.

• A. C. Smith Co. of Milwaukee, the Dravo Corp., Pittsburgh, and Lessels & Associates, consultants of Boston, are all engaged with M-K in the above World Bank-financed power plant projects.

• Stone & Webster, New York, is designer and is supervising construction of the Piratininga thermal-electric power plant on the outskirts of Sao Paulo, a $36-million project scheduled for completion in 1954.

• Burns & Roe, New York, has been designing a series of power plants in Curitiba for a Brazilian utilities company.

• Gibbs & Hill, New York, is consultant to the U.S.-Brazil Joint Commission in power development. This is the commission which recently negotiated the $300-million loan from the World Bank for reconstruction in Brazil.

• Ebasco Services, New York, is constructing a hydroelectric development on the Piexoto River which is designed to supply power for the State of Sao Paulo.

Industrial and railroads

• Morrison-Knudsen is the engineer-contractor for the Vale do Rio Doce Co. on a $26.5-million iron ore mine

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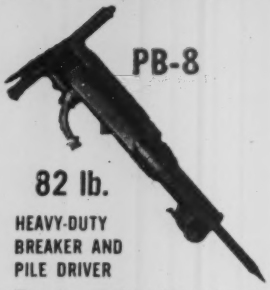

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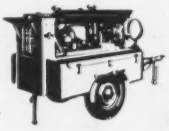

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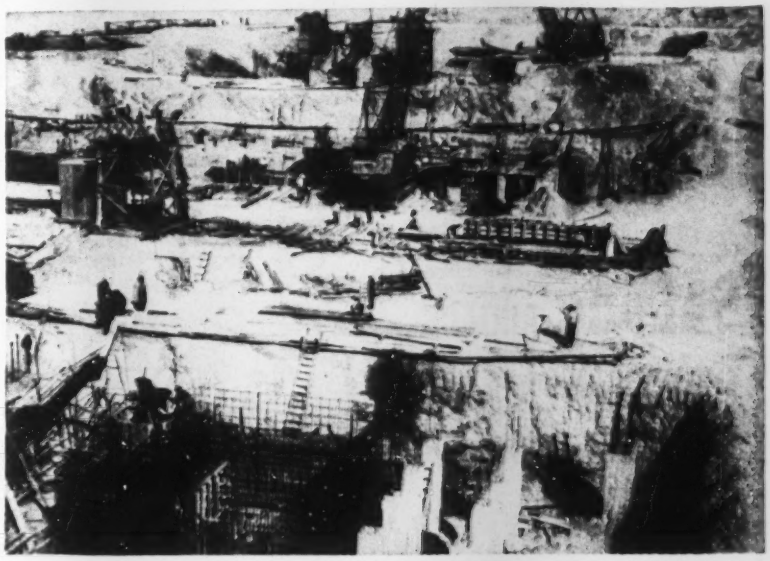


FOUNDATIONS for the Chilean sulphide plant at Chuquicamata are built by natives used to working in the oxygen-short Andean atmosphere.

and its railway connection to the seacoast.

• Foley Bros., Pleasantville, N. Y., has the prime contract to build a railroad and docks in Amapa in connection with development of manganese deposits. The project will begin when the Ex-Im Bank releases funds for construction.

• Arthur G. McKee Co., Cleveland, is consultant on a $45-million expansion of existing steel mill facilities at Volta Redonda. The work includes new blast and open-hearth furnaces and coke ovens which are going to be constructed by Koppers Co., Inc., Pittsburgh.

• Ebasco Services, New York, has the contract for designing a $41-million electric system expansion in the industrial areas of Brazil.

Projected construction

With drawing boards and filing cabinets full of plans for all kinds of construction projects, Brazil continues to offer a field of opportunity for the U.S. consultant and contractor, when and if financing can be provided. Many of the projects are too extensive to be handled by native construction companies.

In Rio de Janeiro a tunnel has been planned to cross Guanabara Bay to link Rio with Niteroi, the capital of the State of Rio de Janeiro. A second project is the complete new city of Goiana, State of Goiaz, when the Brazilians get around to moving the federal capital there from Rio. Subways for Rio de Janeiro and Sao Paulo are a third big project to be watched in Brazil. The engineering plans have been finished (Knappen, Tippetts, Abbett, McCarthy did the report on Sao Paulo in 1948) for the two subway systems which are now awaiting financing. A fourth prospect to be watched is a number of power plants to be built with Point 4 aid, over and above those that are under construction at the moment.

• Greeley and Hanson, Chicago, last year completed a comprehensive survey of industrial wastes and sewage for the city of Sao Paulo. The actual reconstruction of the sanitary system of Sao Paulo is impending right now.

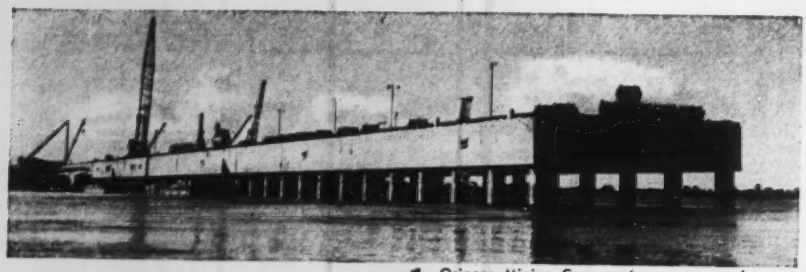
▶ Chile and Bolivia

Until recently, Chile and Bolivia were almost nothing but geographical boundaries for a number of isolated regions. The lack of communication between various areas of both nations prevented development of their natural resources.

But today, the two highland nations are being rapidly opened and their great mining and oil potential is about to be developed.

Native labor is largely unskilled, but is readily available and easily taught construction techniques. (For construction work high in the Andes, U.S. firms find it essential to train the natives, since few skilled North Americans can do heavy work in the oxygen-scarce atmosphere.) Construction materials are available only for small work, so that most big jobs have to import in quantity.

• Foley Brothers Construction Co.,



1. Orinoco Mining Company's new ore and cargo handling dock on the Orinoco River, Venezuela. Composed of 3 units, this DeLong dock is 1,130 ft. long, 82 ft. wide, and 15 ft. deep.

DeLong AIRJACK TRANSFORMS SEA-GOING DOCK-BARGE INTO ORE AND CARGO PIER!

Cuts time, costs!

Field work is practically eliminated in dock construction, due to the development of the patented DeLong Airjack. This new technique of dock construction speeds installation, cuts costs.

The DeLong Airjacks, which are the key to the whole transformation of barge to pier, enable the dock to "climb" the steel columns, or caissons, to required elevation. After the self-lifting operation, caissons are driven to refusal for permanent installations. Caissons are welded to deck and cut off flush; then filled with concrete or sand and tops closed with welded cover plate.

More than ½ million sq. ft. of the DeLong type of pier are in use or under construction in diversified locations that range from the Arctic to South America.

The DeLong Airjack can cut time and costs in the construction of offshore oil well drilling platforms, portable and permanent piers, and many other types of installations. A DeLong dock can be erected and, after having served its purpose, jacked back to water level and towed to a new location.

2. A week after arrival at Orinoco River site, first dock section 376 ft. long berths ship, and unloading begins. Two additional units make this pier 1,130 ft. long.

3. Loaded dock section, fabricated at an Orange, Texas yard, arriving at site on Orinoco River, after being towed across 3,000 miles of ocean. Dock carried caissons, crane, Airjacks, compressors, generators, other installation gear.

4. Crane placing 6 ft. diam., 100 ft. long steel caissons in wells fitted with Airjacks. Crane, Airjacks and other equipment were later transferred to second and third sections for erection purposes.

5. Caissons held in position by Airjacks until dock barge is jockeyed into final position. Caissons are then dropped to river bottom and DeLong Airjacks lift dock to final elevation. Control is so precise, height of dock can be regulated to 1/32 of an inch.

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Latin America

Pleasantville, N. Y., is building a $10-million iron ore mine, rail and port facilities at Guayacan Bay, Chile. The same firm has recently completed a $120-million sulphide plant at Chuquicamata, a town with an elevation of 10,000 ft.

• Koppers Co., Pittsburgh, is carrying out the initial construction and providing for the later expansion of an integrated iron and steel works for the Guayacan Bay project in Chile. Koppers was the consultant on the plant.

• Knappen - Tippetts - Abbett - McCarthy, New York, is consulting and supervisory engineer on design and construction of a 300-mile, $40 million highway between the towns of Santa Cruz and Cochabamba in Bolivia, originally designed by the U.S. Bureau of Public Roads.

• Macco-Pan Pacific Co. of Los Angeles is the contractor on the highway. The work is financed jointly by the Bolivian government and the Export-Import Bank.

▸ Colombia

Although there are some government agencies that do not encourage foreign contractors to work in Colombia, the general picture is favorable. Legislation generally tends to hinder the free development of business but there are no regulations in Colombia that discriminate against foreign companies any more than native.

A basic necessity is to be familiar with the labor laws in order to handle strikes and disputes. Labor is readily available and wages seem low, but about 40% must be added to the nominal rate to take care of social insurance and other benefit payments. Local labor must be employed up to 80% of the payroll.

Construction materials are readily available for all but specialized work, and with the Colombian steel mill at Paz de Rio going into production in 1954, both steel and cement—which is a major industry—will be available in quantity.

Hydro and irrigation

• Frederick Snare Corp., New York, designed and is building a dam, 6½-mile tunnel, penstock and powerhouse on the Lebrija River to supply the industrial and agricultural region of Bucaramanga with power. Cost of the project is $7.2 million, mostly paid by the Colombian government. Snare has also been hired by the city of Medellin to design, supervise, and provide all engineering services for a municipal hydro project.

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- **Rugged, properly balanced design**
- **Frame extra heavy 8″ x 10″ H beam, full length**
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ON MANY DIFFERENT KINDS of construction and maintenance work—even where working conditions make it impossible to use any other machine—the ruggedness, fast action, and extreme maneuverability of the multi-purpose Gradall have paid off!

And now, the new Gradall carrier makes it possible to go more places, to work better than ever before. Its extra heavy rigid design—reinforced from end to end—with a balanced concentration of weight, gives stability for the toughest jobs—without any outriggers or other supports. Its shorter wheelbase gives the Gradall even greater maneuverability in tight spots.

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INTAKE for irrigation drop on the Coella River project in Colombia is on top of an earth dam at the head of a canal.

HIGH IRRIGATION DROP has provision for future hydro installation.

• Utah Construction Co., San Francisco, is building irrigation works on the Coella River with diversion dam and canals to make 100,000 acres arable. Colombia is financing this $6-million project.
• R. J. Tipton, Denver, designed the Coella River project whose irrigation drops are to be used to generate power at some later date. Tipton is also at work on irrigation plans for the Cauca Valley and the Magdalena Valley. No construction has started on these projects whose combined cost will run to $16 million.
• Charles T. Main, Inc., Boston, is the consultant for a hydroelectric plant on the Anchicaya River. The $15-million project is financed partly by the World Bank and partly by the Colombian government.
• Gai Pan American Corp., New York, a subsidiary of Gilbert Associates, has been retained by a Colombian utilities company to design a hydroelectric plant on the Bogota River.
• Knappen - Tippetts - Abbett - McCarthy, is working on the design of two hydro projects on the Campoallegro River near Manizales, with a combined capacity of about 120,000 kw. The estimated cost is $25 million.

Highways and bridges

• Winston, Inc., subsidiary of Winston Bros. Co., Minneapolis, has a $16.5-million contract financed in part by World Bank to construct a new highway connecting the Atlantic seaports of Barranquilla and Cartagena with the interior and thence down to the Pacific seaport of Buenaventura.
• Raymond Concrete Pile Co., New York, is building a 600-mile main highway direct from Cartagena on the Atlantic coast to Buenaventura on the Pacific coast. The $14-million job is being financed in part by World Bank.
• Morrison-Knudsen has $30 million worth of highway construction contracts in the Santander Department, and for connecting Bogota with the west. The work is partly financed by World Bank.
• Utah Construction Co. is rebuilding three highways in central Colombia, west of Bogota, to serve agricultural interests. The work involves 310 miles of road at a contract price of $14 million, partly financed by the World Bank.
• Nathan A. Moore Co., Los Angeles, is doing $4 million of paving and widening on 100 miles of road to the west and south of Bogota.
• American Bridge Co., Pittsburgh, is building three suspension bridges over the Cambao, Saldana and Bolombolo Rivers. The short span bridges (longest 600 ft) will cost a total of $2 million, to be paid by the Colombian government.

Water supply and sanitation

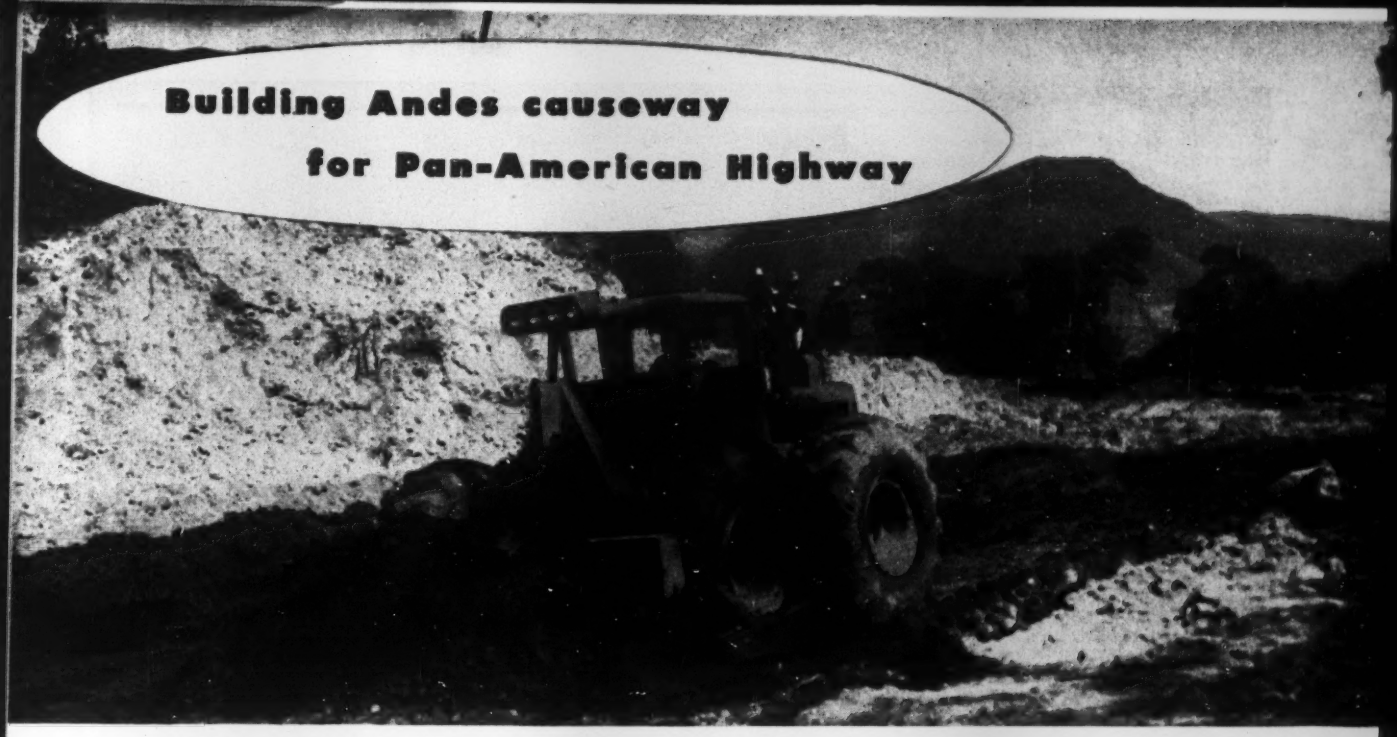
• R. J. Tipton has recently finished designs for a sewerage system and erosion control in Bucaramanga and has also designed the water supply system for the steel works at Paz de Rio.
• The Pitometer Company, Inc., New York, designed and is supervising the construction of an aqueduct and pipeline for a water supply expansion in Bogota.
• Greeley & Hanson, Chicago consultants, is designing a large expansion of the water supply and sewerage systems of Barranquilla.
• Buck, Seifert & Jost, New York, is designing a water treatment plant to handle 70 mgd for Bogota's water supply.

Docks and navigation

• R. J. Tipton is making studies and developing the general plan for improving and opening the Magdalena River to navigation from deep in the interior to the Atlantic coast.
• Frederick Snare is building a $3-million marginal wharf and concrete pile bridge for the government at Tumaco, a seaport serving the southern agricultural district of Colombia. Snare is also erecting dikes and levees at the mouth of the Magdalena River to protect the Shell Oil Company's fields from floods.
• Winston, Inc. is erecting $1.5 million worth of jetties and spurs and dredging a ship canal at the mouth of the Magdalena River for the government.
• Raymond Concrete Pile Co. is expanding port facilities at Buenaventura for the government. The job involves $3 million of docking and ore handling construction.

Railroads and industrial

• Lockwood, Kessler & Bartlett, Inc., consultants, New York, did the mapping of the new Magdalena Valley Railroad, a project involving the complete survey of the 235-mile line.
• Madigan-Hyland, New York, are the design engineers on the Magdalena Railroad which will provide Bogota with a rail outlet to the Pacific.
• Winston, Inc. has been named con-



Building Andes causeway for Pan-American Highway

Tournatractor constructs earthfills to eliminate costly steel and concrete bridges

IN ECUADOR, the Pan-American Highway runs along the heights of the Andes Mountains. The route provides motorists with some spectacular scenery. As you might expect, though, the road also gives highway engineers a tremendous maintenance problem. Heavy rains are frequent and soil erosion causes many bridge washouts. In the past, the bridges were made heavier and heavier, and, naturally more and more costly. Still, they collapsed. Now Ecuador engineers are minimizing those failures by using earthfill causeways and culverts to replace the costly concrete and steel cantilever structures.

Moves rock, clay, loam

At Pungohuaico, for example, 75 miles north of Quito, and only a few miles from the equator, Ministerio de Obras Publicas del Ecuador replaced a destroyed bridge with a typical culvert and earthfill. Working at an altitude of approximately 9000 ft., the government's high-speed, rubber-tired Tournatractor moved a total of 30,000 cu. yds. of clay, loam and 8 to 18-inch boulders to fill a deep ravine formerly spanned by the bridge.

Tournatractor first cut back banks and graded to straighten a curve and eliminate a steep grade on the road. It then built a retaining wall to prevent erosion. Despite decreased mechanical efficiency common to the extreme 9000-ft. altitude, Tournatractor moved 2 cu. yds. per pass and easily kept the project on schedule.

Drives where trucks cannot go

Besides its high production, Tournatractor's mobility was a major factor in reducing costs. The unit was driven 75 miles from Quito to this task under its own power. Says J. Stanley Williamson, Consulting Engineer to the Ecuadorian government, "Tournatractor's high speeds from task-to-task have eliminated costly, and at times, impossible trucking conditions here in Ecuador. Tournatractor is especially good for clearing landslides which block roads during rainy seasons."

This big rubber-tired tractor can give you similar efficiencies on your earthmoving or maintenance projects. Your LeTourneau-Westinghouse Distributor has all the facts. He will be glad to estimate your equipment needs. There's no obligation.

Tournatractor dozes loam and clay over edge of ravine. Despite working at 9000-ft. altitude, unit's 186 hp and 4-wheel drive provided plenty of power.

Tournatractor's big 4-wheel air brakes assure fast, instant stops, allow operator to work safely at edge of bank. Its simple electric controls are easy to operate, reduce operator training time.

Tournatractor—Trademark T-342-B-b

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Shrewd men adopted the water turbine as a source of power in ever greater numbers. But S. Morgan Smith's pioneering spirit continued—a spirit still manifesting itself in our endless research and experimentation—factors in the future development of POWER!

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POWER *by* SMITH

HYDRO PLANT in Bucaramanga is one of many such projects in Colombia.

tractor for construction of the Magdalena Valley Railroad. The whole job includes repair shops and marshalling yards and will cost $50 million of which $25 million is being paid by a loan from the World Bank.

Refineries

• Foster Wheeler Corp., New York, is building a $30-million refinery at Barrancabermeja on the Magdalena River for a Colombian oil company.

• Nathan Moore Co. Los Angeles is improving roads and building foundations for the Barrancabermeja refinery.

• Raymond Concrete Pile Co., is building a revetment wall along the Magdalena River to protect the Barrancabermeja refinery.

• Arthur G. McKee Co., Cleveland, is constructing an integrated $40-million steel mill at Paz de Rio for a Colombian corporation.

• Nathan A. Moore, Los Angeles, is building some foundations for the mill and doing stripping for the iron ore mine.

• Winston Bros., Raymond Concrete Pile Co., and the Bechtal International Corp., New York, are carrying out a $5-million complete renovation and expansion of the electric system of Medellin.

Future prospects

Hydroelectric power plants are planned near Bogota, near Medellin and in several other parts of the country. These projects will amount to some $250 million.

There is an extensive airport building program in the offing with the international airports at Bogota and Cali in the forefront. The Magdalena River railroad project will require further works in road building and a probable later extension of the railroad to the northern coast, as well as the clearing of the virgin forest and the opening of the land for farming.

Another future project is the construction of pipelines both for raw oil and refined products over difficult, mountainous terrain.

Development of natural resources, such as coal and asbestos, will create new transport and shipping problems necessitating new construction jobs. The National Planning Council, an advisory board for the President of the Republic, is going ahead with vast development plans, the first of which in the Atlantico Department will cost $40 million.

▶ Ecuador

This country is rapidly evolving as an economic force in Latin America and future construction should be plentiful.

Unskilled labor is readily available, skilled labor less so. Construction materials are to be had, but as yet they cannot be obtained in large quantities. Considering the size of the country there is a good deal of work being done now by U.S. firms.

• Harold T. Smith, Washington, D. C., is constructing a $12-million water supply system for Quito, the capital. The project is financed by the Ecuadorian government and the U. S.'s Export-Import Bank. The company has recently completed a hydroelectric development to supply the province of Tungurahua with power, and is now constructing improvements to the nation's highway system.

• Tucker McClure, Inc., Los Angeles, designed the 120-mile Quevada-Manta highway for the Ecuadorian government.

• Pan American Engineers & Constructors, New York, is the contractor on the $17-million Quevada-Manta highway. The work is being partially financed by the Export-Import Bank.

Future construction

• Knappen - Tippetts - Abbett - McCarthy, have completed engineering and port development plans for the cities of Guayaquil and San Lorenzo.

▶ Peru

U.S. firms should meet with relatively good working conditions in Peru. There are only normal restrictions, and no rulings against bringing in skilled labor in any amount. Customs duties are low for the import of construction equipment, and certain machinery to be used on government projects is duty-free.

The supply of construction materials is good, and both skilled and unskilled labor plentiful.

On big jobs, such as hydroelectric projects and port facilities, Peruvian construction companies offer little competition. However, on smaller work, Peruvians are able to secure contracts at lower bids than foreign companies could make.

PIER at San Juan Bay, Peru will augment present iron ore handling facilities in growing mining industry.

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in all road applications of asphalt — surface treatment, mixed-in-place (mulch), penetration macadam, etc.

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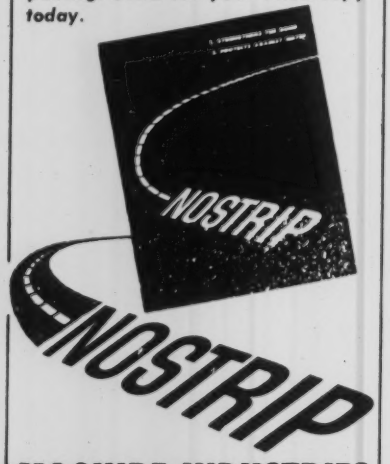

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Wide World photo

HIGHWAY CONSTRUCTION in Venezuela's mountains is one of the largest cut-and-fill jobs in the world. Road will link Caracas with the coast.

Irrigation and hydro

• Morrison-Knudsen Co. is the contractor on a $10-million government financed irrigation project on the Quiroz River for the Department of Piura. The project will irrigate some 60,000 acres.

• Harold T. Smith Co. is sinking $1 million worth of tube wells for irrigating desert land for the cotton firm of Anderson, Clayton of Houston, Tex.

• Cerro de Pasco Corp., New York, is building, for itself, a $12-million hydroelectric power station in Pancartambo to supply power for its zinc refining plant. Ebasco Services, Inc., New York, is the consultant and construction supervisor on this plant.

Mining and port facilities

• Utah Construction Co., is building a mining town and ore handling facilities at San Juan Bay to serve the Marcona iron-ore deposit. Pacific Bridge Co., San Francisco, built the pier for Marcona. It is a $6-million project.

• American Smelting & Refining Co. is constructing roads, ports, railway, housing, smelter, and mining facilities at Toquepala and Quellaveco, Department of Moquegua. The $160-million development for copper mines is being carried out for the Southern Peru Copper Corp.

• Frederick Snare is expanding port works which it originally built at Matarani in 1940.

• The McDonald Engineering Co., Chicago, designed and is serving as consultant on a $4-million improvement of port facilities at Callao.

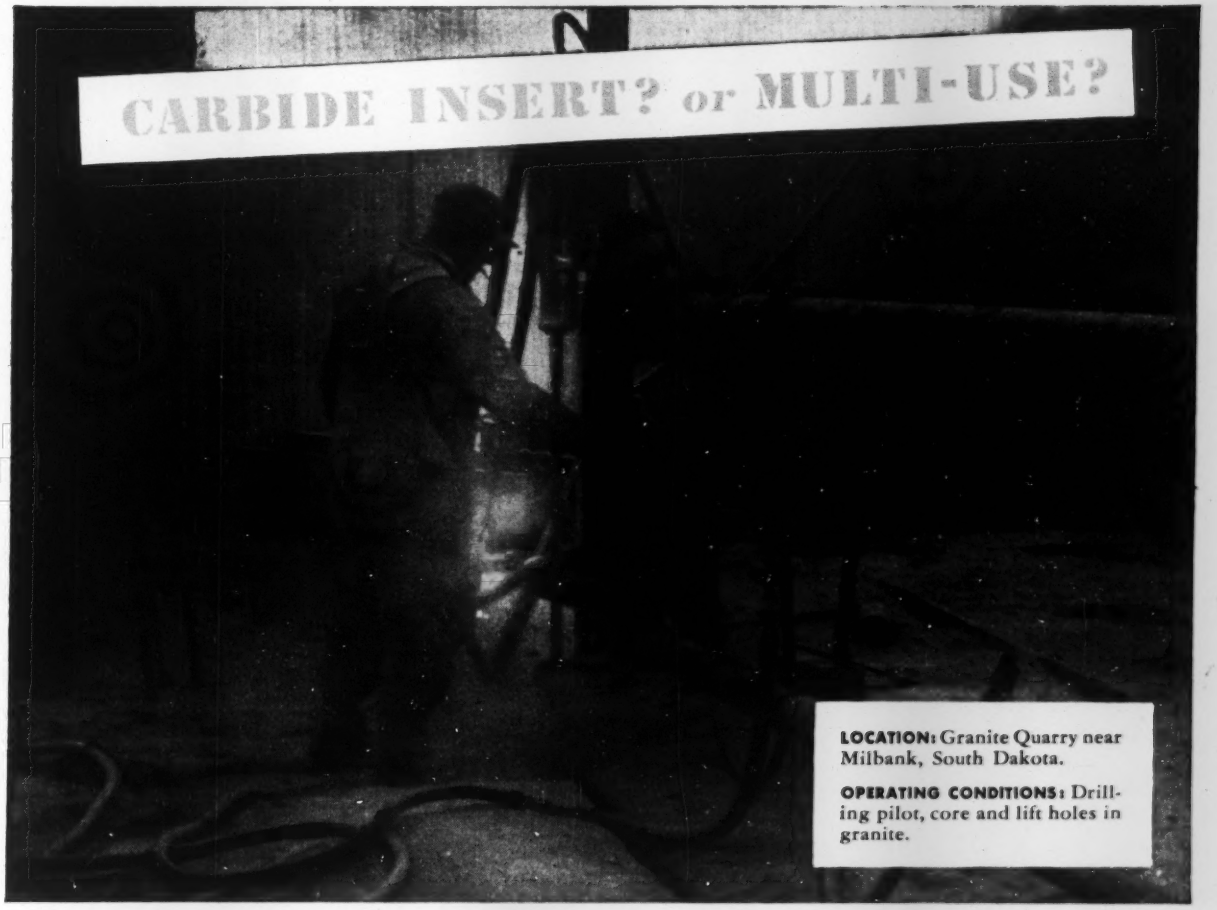
Future prospects

• Robert G. LeTourneau, U.S. manufacturer of earth-moving equipment, has proposed to the Peruvian government that he reconstruct 22 miles of the Trans-Andean highway from Pucallpa, and build 30 miles of new paved highway into the forest country towards Puerto Inca. In return he has asked a land concession for a LeTourneau-built colony and town. If the project is approved and proves successful, LeTourneau may extend the highway as far as Oxapanpa in eastern Peru.

To be watched by U.S. firms is the Peruvian government's five-year plan for construction of roads, irrigation projects, schools, hydro developments and public buildings. The plan will probably be financed through the influx of foreign capital in the mining and oil industries.

▶ Venezuela

One of the richest mining and oil regions in the world, Venezuela is


CARBIDE INSERT? or MULTI-USE?
LOCATION: Granite Quarry near Milbank, South Dakota.
OPERATING CONDITIONS: Drilling pilot, core and lift holes in granite.

Dakota Granite Co. drills granite 40% faster— 34% cheaper with TIMKEN® carbide insert bits!

DRILLING speed? 40% faster! Cost per foot of hole? 34% less! Dakota Granite Co. obtains these results by using Timken® carbide insert bits to drill pilot, core and lift holes at its granite quarry near Milbank, South Dakota.

Timken carbide insert bits give you highest speed through hard and abrasive ground. They're always most economical for constant-gage holes, small diameter blast holes and very deep holes.

But they may *not* always be best for *all* your drilling jobs!

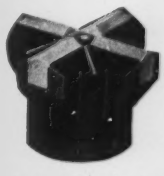
Timken multi-use bits are most economical for drilling ordinary ground. With correct and controlled reconditioning, they give you lowest cost per foot of hole when full increments of steel can be drilled.

If you're drilling ordinary *and* hard abrasive ground, use both Timken carbide insert *and* multi-use bits. They're interchangeable in the same thread series. As many as 93 different sizes of Timken bits fit the same drill steel! You can quickly and easily change bits as the ground changes, right on the job!

All Timken bits are made from electric furnace Timken fine alloy steel, have the shoulder union developed by Timken that protects threads from drilling impact.

To make sure you're using the best bit type on your drilling job, ask the Timken Rock Bit Engineering Service. Write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

Timken threaded multi-use rock bit



Timken threaded carbide insert rock bit

your best bet for the best bit . . . for every job

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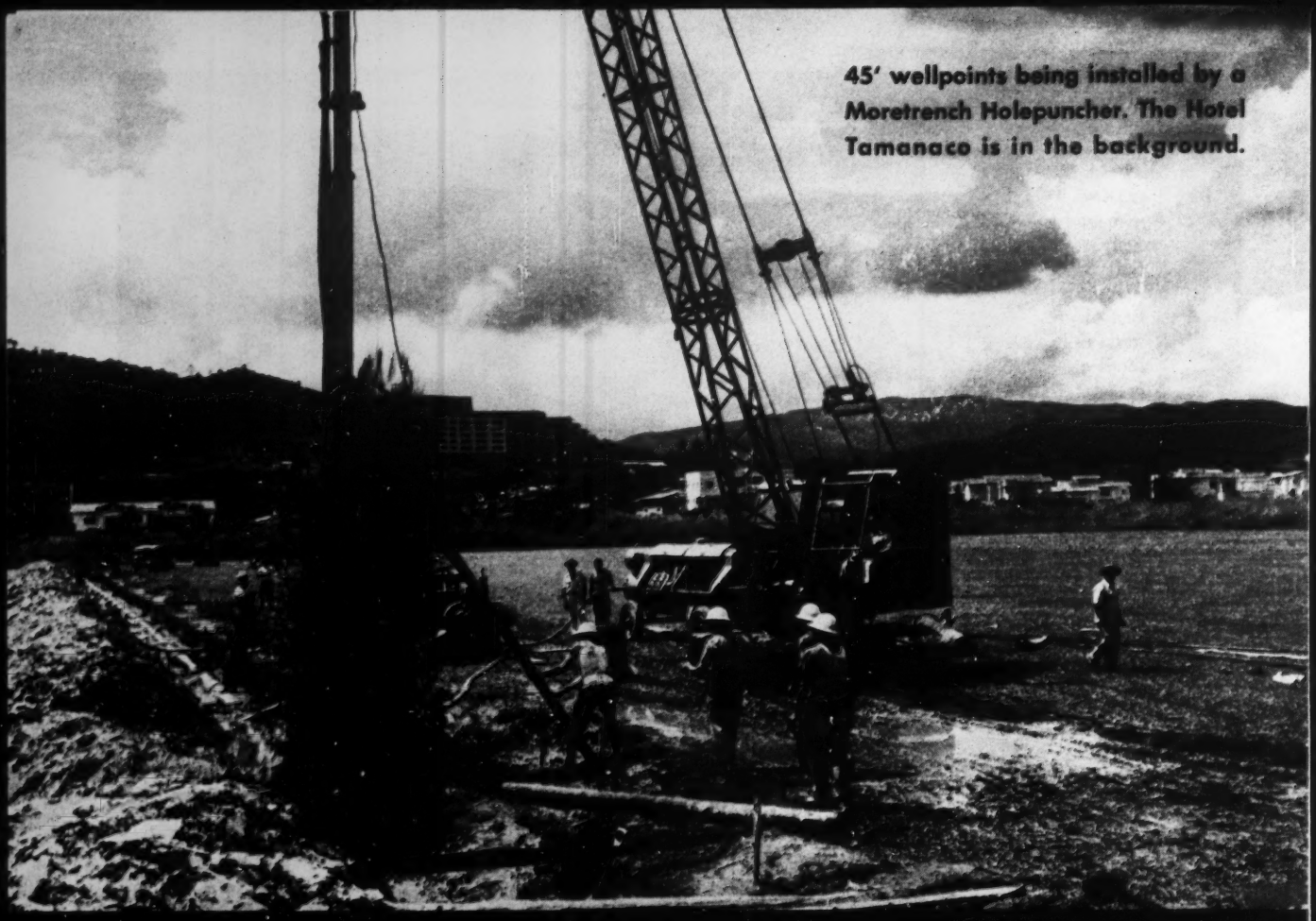

45' wellpoints being installed by a Moretrench Holepuncher. The Hotel Tamanaco is in the background.

THE WORLD'S LARGEST WELLPOINT WATER SUPPLY SYSTEM

What we believe is the world's largest wellpoint water supply system has recently been installed by Moretrench engineers in Las Mercedes, a suburb of Caracas, Venezuela.

Designed to provide 1800 GPM (115 liters per second), the Moretrench Wellpoint System draws water from the sand and gravel beds of the Rio Guaire in ample supply for the requirements both of Las Mercedes and the new luxury Hotel Tamanaco.

Low in cost, easily installed, economically operated, Moretrench Wellpoint Equipment is being used extensively all over the world for predraining wet excavations and for supplying water wherever ground water is available.

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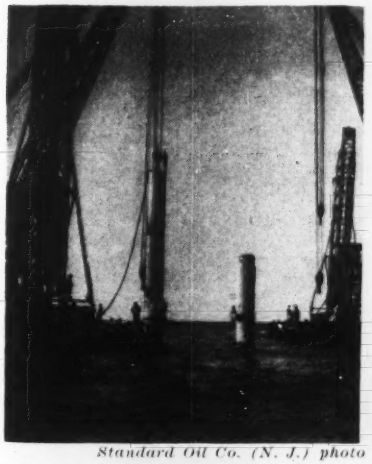
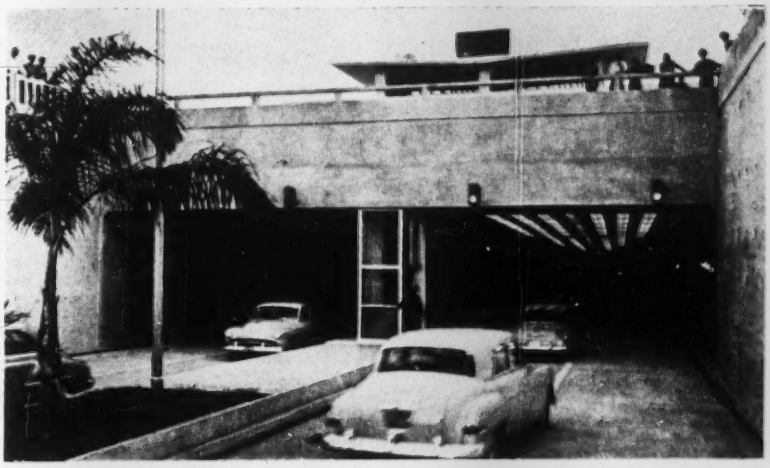


Standard Oil Co. (N. J.) photo

DOWN GO CAISSONS for an oil drilling rig in Venezuela's oil-rich Lake Maracaibo.



VEHICULAR TUNNEL under the Almendares River in Havana, Cuba, was opened to traffic on April 25.

booming with new construction and capital to pay for it.

The only major concession that U. S. contractors must make to Venezuelan business regulations is that 75% of their personnel must be native. Skilled labor is greatly in demand at the moment, but there is plenty of unskilled. A good many companies run training schools to overcome the skilled labor shortage.

The supply of construction materials is good, except for structural steel, which must be imported.

Construction equipment may be imported without any special tariffs, and there is a good and steady market for it. However, the contractor who has purchased it there cannot take equipment out of the country without a special government permit.

The mining and oil boom in Venezuela will last a long time and with the inevitable growth of the country there will be a need for U. S. firms to handle the big jobs. It is a region worth watching.

Construction for mining

• Morrison-Knudsen Company, Boise, Idaho, Peter Kiewit Sons Co., Omaha, Neb., Raymond Concrete Pile Co., New York, and Macco-Pan Pacific Co., Los Angeles—all are involved in construction of railways, access roads and bridges, foundations and ore handling facilities for the Orinoco Mining Co. of Venezuela.

• Knappen - Tippetts - Abbett - McCarthy is doing the design, plans, and specifications for terminal facilities at Puerto Ordaz for the Orinoco Mining Co. Two of the most interesting structures in the job are a crusher structure 100 ft deep in solid rock and the concrete cantilever roofs for reclaiming tunnels that must support an 80-ft depth of ore.

• The McDowell Co., Cleveland, is erecting a $10-million conveyor at Puerto Ordaz for Orinoco.

• Bechtel Corp. is the engineer for all of Orinoco's roads, railways, bridges, and mining facilities.

• Frederick R. Harris, Inc., New York, has designed an $8-million dry dock to be built at Puerto Cabello for the Venezuelan government. The dock is to be carved out of solid rock and will be used for the repair of ore and oil boats.

Construction for oil

• Atlantic Gulf Pacific Co., Gahagan Overseas Construction Co., McWilliams Dredging Co., and Standard Dredging Corp., all of New York are engaged in providing a navigable channel and piers for oil tankers in oil-rich Lake Maracaibo. The $50-million operation is being financed by independent oil companies in the area.

• The Lummus Co., New York, has recently completed or is currently engaged in seven oil refinery installations including storage, power plants, docks and housing facilities.

Civil improvements

• Morrison-Knudsen, is building a $70-million highway from Caracas to La Guaira. The work includes a $23-million twin bore tunnel. Smillie and Griffin, New York consultants, designed the road.

• R. J. Tipton, Denver, is consultant for the Venezuelan Ministry of Public Works in connection with a water development program. Under investigation are 15 irrigation projects.

► W. Horace Williams Company, New Orleans, is the contractor on a wharf and calcining plant being built for the Aluminum Company of America in Moengo, Surinam (Dutch Guiana).

CENTRAL AMERICA

The countries of Central America vary as widely in their possibilities for utilizing U. S. technical services as do those of South America. Mexico is doing the most in this respect although it is rapidly developing a corps of native contractors and engineers that can supply most of its needs. Relatively less developed, the other countries of the region are badly in need of transportation, sanitation and housing, and lack the technical skills to provide them and the money to finance them. Nevertheless here, too, American firms are at work on a few essential projects which are classified, in the power, port development and highway fields.

For the most part construction materials are in sufficient supply to meet the limited demand. Unskilled labor is ample, skilled is lacking.

► Mexico

Compared to the amount of construction work in Mexico, American firms exert a minor influence, although they hold a number of significant contracts. Even on the largest jobs Americans find it difficult to underbid Mexican contractors.

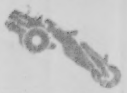
Unskilled labor is plentiful, and skilled labor only slightly less so. Construction materials are on hand in quantity, and their transportation is rapid over the growing network of highways and railroads.

There are virtually no restrictions against U. S. firms in Mexico other

Only the Terra Cobra offers

10-SPEED PERFORMANCE

adaptable to all your jobs!



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Big 17.5 yard Terra Cobras are the first 2-wheel tractor scrapers with the complete necessary range of ten practical gear steps — balanced power that handles every range of work from the toughest borrow pit to the fastest haul road. Every power range is at your operator's command — all the time — with no changeover required. 10-speed Cobras work right in with any equipment on your spread, handle slow hard going one minute, move over instantly to fast easy going and hauls to 35 mph. For peak efficiency on every part of every earthmoving job — for the versatility and faster work cycles required to make your jobs pay off today, pick the 10-speed Cobra that's designed and built to move your dirt at a lower cost.

TERRA COBRAS OFFER ALL THESE FEATURES COMBINED:

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- Big 17.5-Yard Capacity
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- 25-Inch Ground Clearance
- Giant 24:00 x 25 Tires
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Latin America

than a ruling that only 10% of the skilled labor force may come from outside the country.

• Morrison-Knudsen is the contractor on the $9-million Mocuzari storage dam on the Mayo River. This earth-fill dam, with its diversion tunnels and channel, is being financed by the Mexican government.

• Arthur G. McKee Co., Cleveland, did the design work on a government-controlled, $15-million lubricants plant at Salamanca. McKee also made the studies for the expansion of the iron and steel mill at Monterrey.

• H. E. Bovay & Co., and Texas-Tellepsen Construction Co., both of Houston, are engineers and construction supervisors for a sulfur processing plant for the Mexican Gulf & Sulphur Co.

• Brown & Root, Houston designed and is doing the construction supervision on another sulphur processing plant for the Pan American Sulphur Co. All these chemical plants are partly financed by the Export-Import Bank.

Elsewhere in Central America

• J. A. Jones Construction Co. Charlotte, N. C., is the contractor on a $19 million hydroelectric development on the Lempa River in El Salvador. World Bank has loaned $12.5 million for the construction of the dam, power plant and transmission lines.

• Harza Engineering Co. Chicago, designed the Lempa River hydroelectric development, and construction is under its supervision.

• Johnson, Drake & Piper, New York, is constructing a bridge and highways for the Guatemalan government under a $6.5 million contract.

• Morrison-Knudsen signed with the Guatemalan government July 2 for $5-million of new dock and port construction at Santo Tomas on the Caribbean coast.

• Standard Dredging Co., New York, has the subcontract for harbor dredging for the new port works at Santo Tomas.

• Westinghouse Electric Co., New York, is making a complete survey and recommendations for a proposed $5 million hydro project on Guatemala's Pacific coastal slope, near Jurun.

• The Bank Builders and Equipment Corp., St. Louis, is erecting one bank building for the Honduras government at Tegucigalpa and another at Pedro Sula.

• J. A. Jones Construction Co., Charlotte, N. C., is working on a high-

Here's exactly what you need for quick, economical pavement repairs and small surfacing jobs . . . in any season . . . under wet or dry conditions. It's the McConnaughay HTD-B Mixer, precisely engineered and rigidly constructed to handle on-the-job mixtures of asphaltic concrete, sheet asphalt, sand asphalt or mastic asphalt . . . hot or cold . . . at remarkably high rates. It will enable you to meet all conditions with least effort and at lowest possible costs the year 'round. Write, wire or 'phone today for details and specifications.

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Prepare cold asphaltic mixtures —up to 10 tons per hour.

Prepare hot asphaltic mixtures —up to 5 tons per hour.

Dry various types of wet aggregates quickly, thoroughly.

Remove both moisture and solvents from bituminous mixtures.

Produce bituminous mixtures with tars, paving asphalts, cut-back asphalts, and emulsified asphalts.

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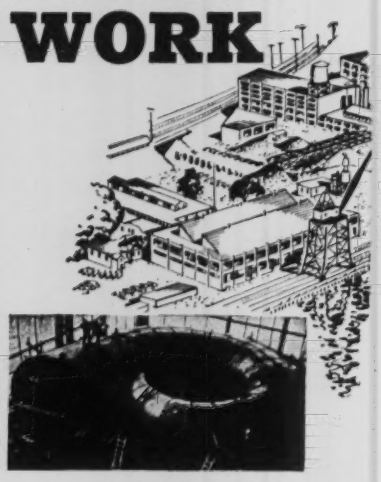
STEEL PLATE WORK



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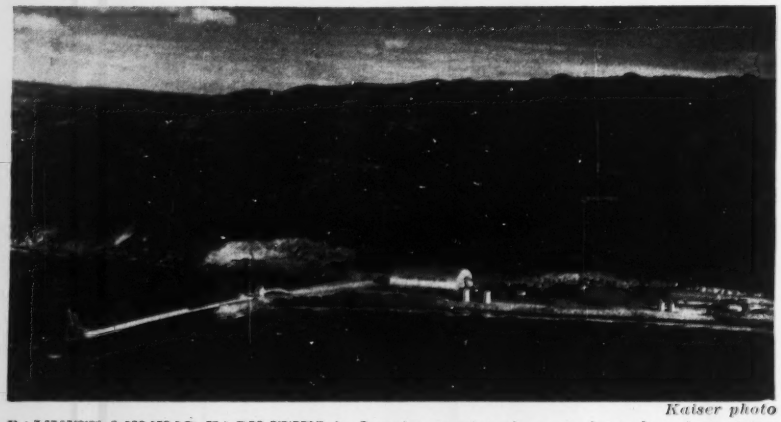


Kaiser photo

BAUXITE MINING FACILITIES in Jamaica consist of a complete plant for mining and shipping ore to the states.

way for the government of Honduras to connect the capital city of Tegucigalpa with the Inter-American highway to the south of the capital.

And, in Honduras, there's the proposed construction of a complete new international airport and terminal at San Pedro Sula. The work will include two 8,000-ft runways, hangars and an administration building.

The U. S. Bureau of Reclamation has carried out extensive surveys in the last two years of the hydroelectric potential of Nicaragua and Costa Rica. Within a year or two, these studies should be the basis of definite construction in the two countries.

Greeley & Hanson, Chicago, has rendered a report on the need for reworking the water supply and sewage systems of Panama City, Panama, but noting the lack of financing to carry out the work. Panama City also needs low-cost housing and hopes to finance a housing program over an extended period with financial aid from local and national agencies within Panama.

THE CARIBBEAN

Unskilled labor is plentiful, skilled labor relatively scarce in the Caribbean Islands. With virtually no restrictions against U. S. firms, the area is on the brink of an industrial revolution. For the most part, construction materials must be imported, but brick, cement and lumber are readily available.

• Kaiser Engineers, Oakland, Calif., has recently finished supporting facilities for bauxite mining in Jamaica: The $12-million job includes a 13-mile railroad, deep water pier, ore handling and processing facilities.

• Ebasco Services, Inc., New York, is working on a $34-million electric system expansion in Cuba. The work is financed by a loan from the Export-Import Bank which was negotiated through Technical Cooperation Administration of U. S. government.

• Johnson, Drake & Piper, New York with the Dwight Winkleman Co., Syracuse, is working for the U. S. Bureau of Yards & Docks at Guantanamo, Cuba, on the $6-million construction of runways, hardstands and aprons for a Naval Air Station.

• Frederick Snare Co., New York has a $2-million contract with the Bureau of Yards & Docks for construction of hangars at the Guantanamo air base in Cuba, for which Roberts & Schafer Co. of New York did the engineering designs.

• Raymond Concrete Pile Co., New York has recently completed the $5-million Almendares River Tunnel in Havana for the Cuban government.

• Brown and Root, Houston, Texas, is contractor on Haiti's flood control, irrigation and hydroelectric project in the Artibonite and Estere River Valleys. The $40-million work is being financed partly by a loan from the Export-Import Bank through an arrangement with the TCA.

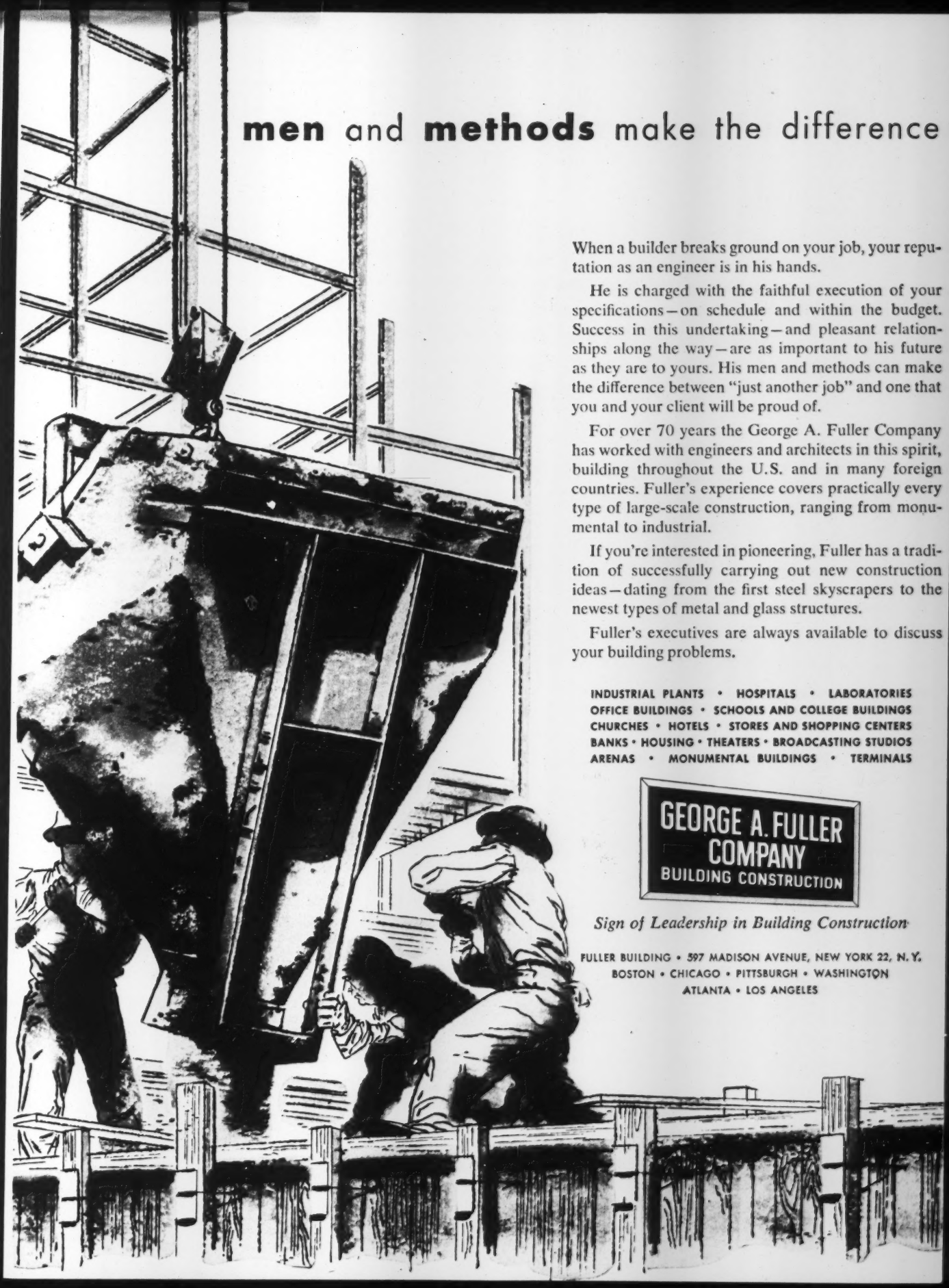
• Knappen - Tippetts - Abbett - McCarthy, New York, is the design consultant on the Haitian work, which includes a 250-ft high concrete dam. This same firm has started engineering surveys for Cuba's first hydroelectric plant, to be built on the south shore of the island, near Santiago.

• Lock Joint Pipe Co., East Orange, N. J., is contractor for the Santiago water works in Santo Domingo.

• Elmhurst Construction Co., New York, is building the Columbus Lighthouse—a structure planned as a monument to America's discoverer—in Santo Domingo, and roads in the interior of the island for the Dominican government.

(*Continued on page 55*)

men and **methods** make the difference



When a builder breaks ground on your job, your reputation as an engineer is in his hands.

He is charged with the faithful execution of your specifications—on schedule and within the budget. Success in this undertaking—and pleasant relationships along the way—are as important to his future as they are to yours. His men and methods can make the difference between "just another job" and one that you and your client will be proud of.

For over 70 years the George A. Fuller Company has worked with engineers and architects in this spirit, building throughout the U.S. and in many foreign countries. Fuller's experience covers practically every type of large-scale construction, ranging from monumental to industrial.

If you're interested in pioneering, Fuller has a tradition of successfully carrying out new construction ideas—dating from the first steel skyscrapers to the newest types of metal and glass structures.

Fuller's executives are always available to discuss your building problems.

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Modern Aggregates Plant in Operation at Aden

Plant installed by Bechtel helps build new 100,000 barrel-per-day oil refinery for Anglo-Iranian Oil Company

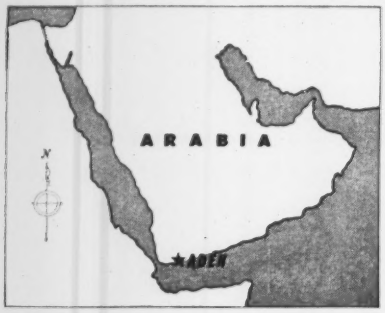
Anglo-Iranian Oil Company's new 100,000 barrel-per-day refinery, located at Aden near the southernmost tip of the Arabian peninsula, will be constructed with aggregates produced by one of the world's most modern all-purpose quarry plants.

The plant was engineered and manufactured by PIONEER Engineering Works at the request of Bechtel Corporation of San Francisco. It is supplying crushed stone for docks, jetties, piers, and concrete aggregates to be used in construction of the giant refinery and its attendant facilites.

One-half million yards of aggregates

Size of the project is shown by the fact that eventual plans call for use of nearly one-half million yards of aggregates. It is expected that between 12,000 and 15,000 construction workers recruited from most of the free nations of Europe and Asia will be employed on the job.

Bechtel, one of the world's foremost international builders, have used PIONEER equipment for a number of years, so it was natural that they called upon Coast Equipment Company, PIONEER's San Francisco distributor, for help in obtaining a high quality



plant of sufficient capacity, simple operation, and low maintenance.

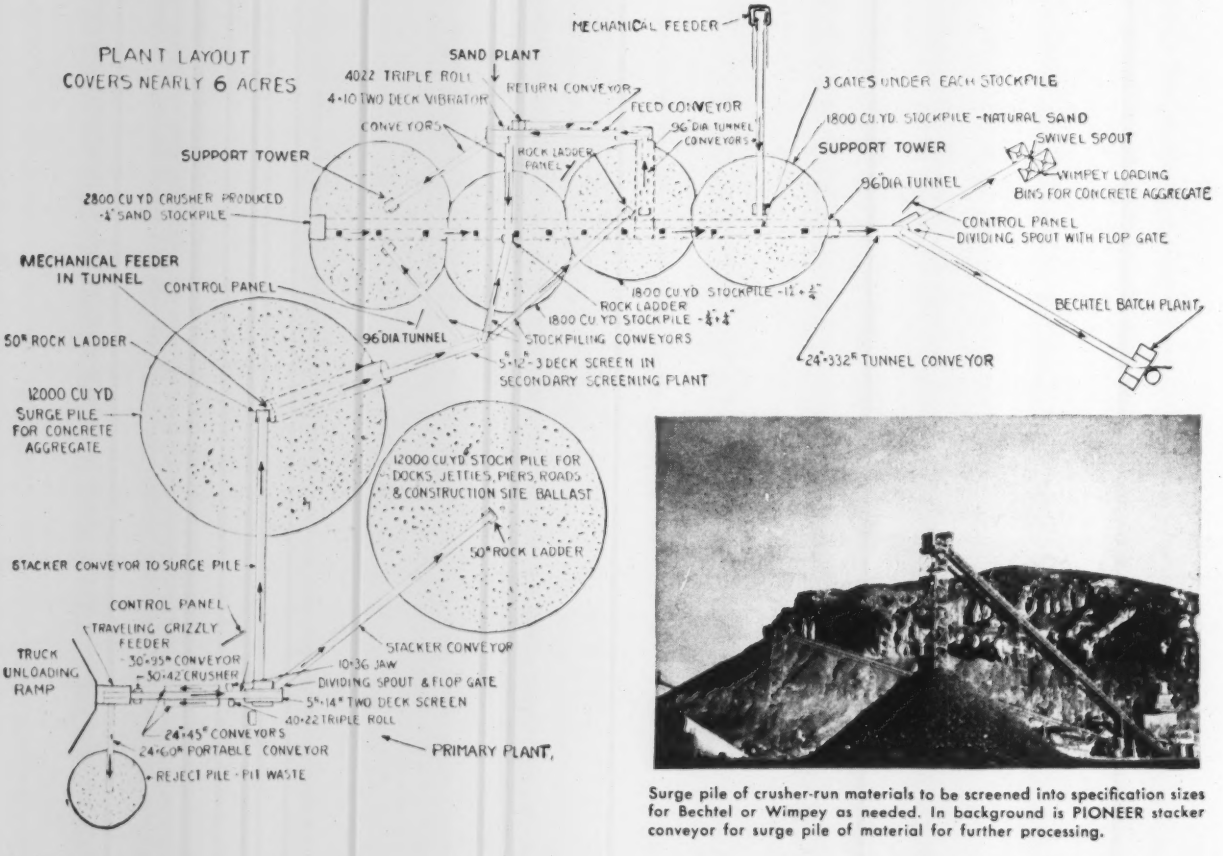
There was, of course, considerable preliminary work to be accomplished. First, a PIONEER engineering-geologist was sent to London to develop tentative plans for the big plant which was to supply materials for both Bechtel and the British joint contractor, George Wimpey & Co., Ltd. Then, at Bechtel's request, PIONEER's engineer went to Aden to survey possible quarry and plant sites.

A detailed examination of available aggregate sources disclosed that careful testing and analysis would be needed. With the material source and concrete-aggregate mix thus scientifically selected, PIONEER could assure Bechtel and Anglo-Iranian that all possible precautions had been taken to provide a Portland cement concrete of the highest durability and permanence.

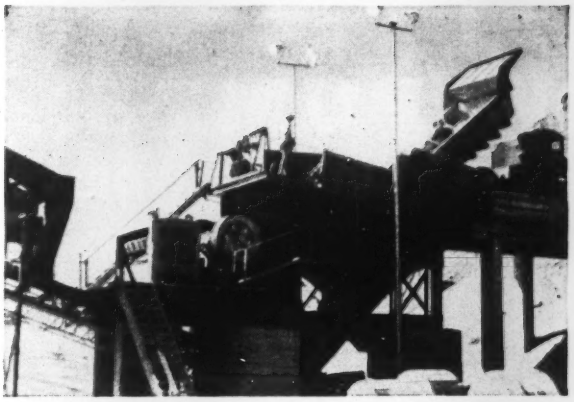
The result is a complete, high production plant which has been called the world's most modern.

Occupies six acres

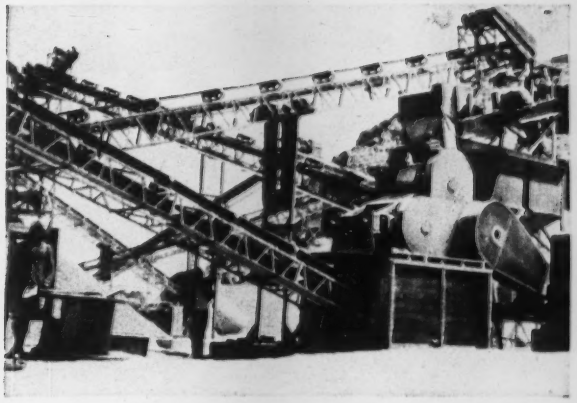
Although it occupies six acres, it can be operated by a crew of as few as five men. This is made possible by use of push-button stations on four strategically placed control panels. From these, conveyors and screens can be operated, material gates opened and closed, and the entire flow governed by remote control. Surge piles of materials requiring further processing to meet rigid specifications and finished product piles for concrete aggregates are provided.



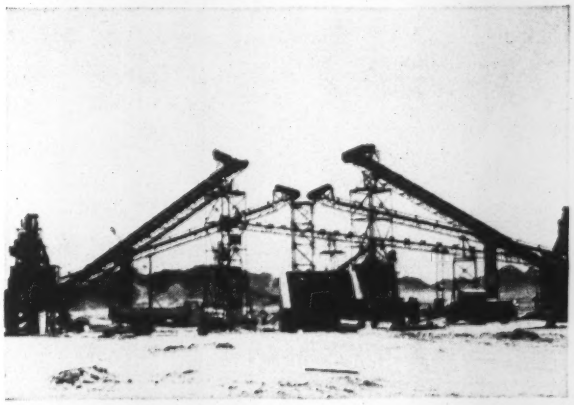
Surge pile of crusher-run materials to be screened into specification sizes for Bechtel or Wimpey as needed. In background is PIONEER stacker conveyor for surge pile of material for further processing.



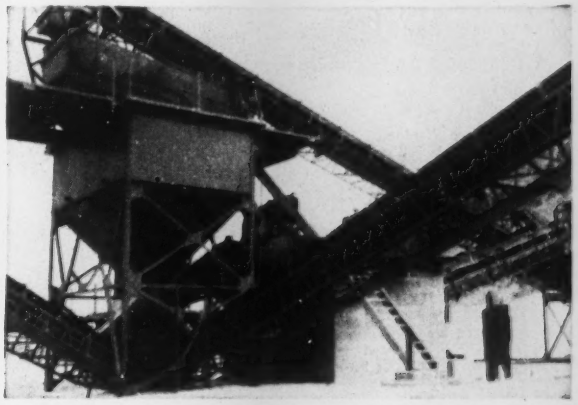
PIONEER 163 Primary Unit, consisting of 48" x 14' Traveling Grizzly Feeder and 3042 Jaw Crusher, receives tough trap rock from quarry, reduces it to minus 8". Material then goes via 30" x 95' conveyor to secondary crushing cycle.



In secondary crushing plant, material is separated on a 2-deck 5' x 14' PIONEER Mesabi Vibrating Screen. Plus 6" goes to 1036 Jaw Crusher. Material from 6" down to top specification size goes to 4022 Triple Roll. Both products are returned in closed circuit.



Stockpiling and Sand Plant delivery conveyors. Note tunnel abutment in foreground. In the distance, delivery conveyor from product tunnel to batch plant is visible.



Sand Plant, where surplus — 1½" + ¾" is used to manufacture specification sand. This enables the contractor to utilize the entire quarry feed as pay material.

The first of several shipments left PIONEER's Minneapolis factory in December, 1952. Eighteen flat cars were needed to transport the entire plant.

All equipment arrived at Aden intact and undamaged. There, a PIONEER erection engineer was waiting to supervise its installation. Sixty days later it crushed the first rock.

The "plant" actually consists of four major units . . . a primary and secondary crushing plant, a secondary screening plant, product stackers with reclaiming system, and a sand plant.

Hard, tough trap rock is blasted from a cliff 1000 feet away. After reduction to -1½" by the three primary and secondary crushers, it is surge-piled over a mechanical feeder and conveyor located underground in a reclaiming tunnel.

Material is then conveyed to a sizing screen which seperates it into three sizes (-1½" + ¾", -¾" + ¼", and -¼") each of which is stockpiled over a long reclaiming tunnel. Under each of these product piles are three electrically-controlled, air-activated gates which allow the operator to feed selected sizes onto the tunnel conveyor.

This conveyor is equipped with twin spouts and a solenoid-controlled flop-gate so it can supply either the batch plant or any one of three 21-yard bins. When desired, excess material from the -1½" stockpile over the tunnel can be sent directly to the sand plant.

Since the plant began production, operation has been almost continuous, and original performance expectations are being exceeded.

This is another example of the PIONEER EDGE in action. All over the world, PIONEER equipment is known for its high output and low maintenance. Couple this with an alert distributor organization and an experienced staff of engineering specialists who will survey distant locations and design an installation to fit the need . . . and you have a combination that's hard to beat.

If you are bidding on a large-scale overseas construction project, PIONEER's engineering staff is at your disposal. This gives you a competitive advantage that may make the difference when bidding is close.

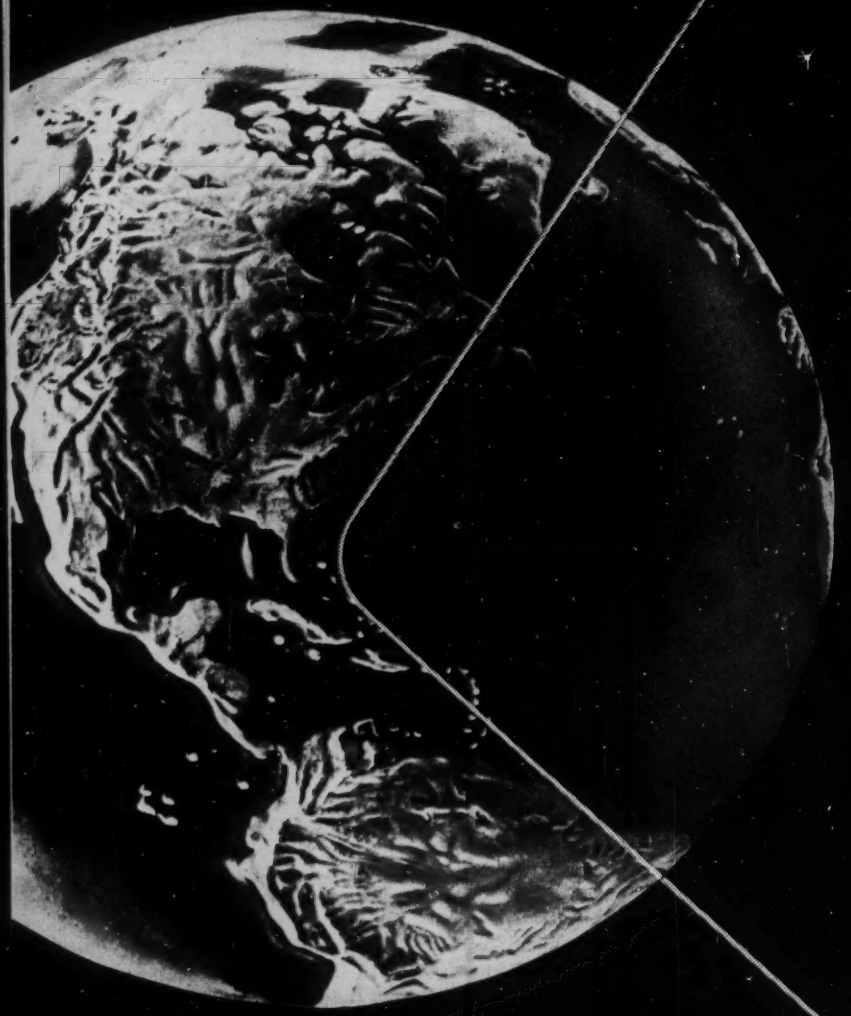
For details, write to PIONEER Engineering Works, Inc., Minneapolis, Minnesota. (A subsidiary of Poor & Company, Chicago.)

BUY BOTH! HIGHER OUTPUT LOWER UPKEEP

Pioneer *Continuflo* EQUIPMENT

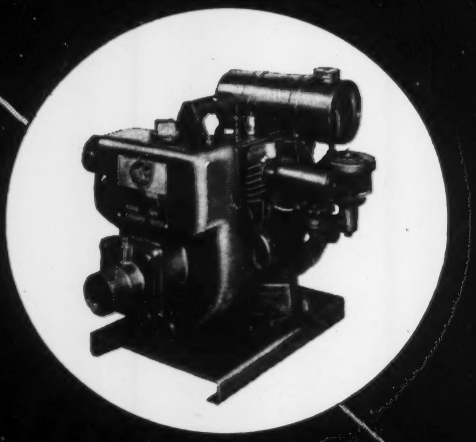
MARLOW PUMPS...

relied on **THROUGHOUT** *the* **WORLD**



No other comparable pump is built as simply or as ruggedly, as a Marlow Pump. Sold and serviced by more than 600 Dealers throughout the United States and 53 foreign countries, Marlow Pumps are engineered to outperform and outlast *any* other pump. For dependable pumps, look to your Marlow dealer, there's one near you.

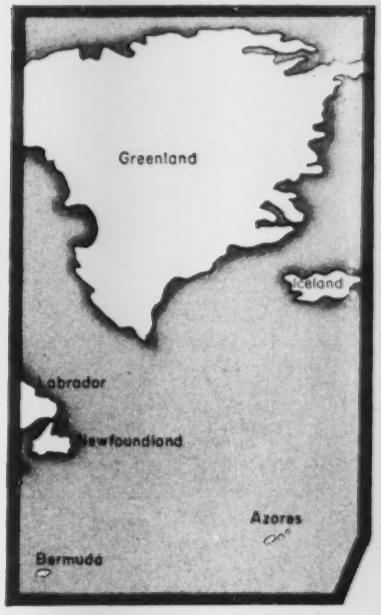
Self-Priming and Straight Centrifugal, Diaphragm and Plunger Pumps. Literature Available on Request.



MARLOW PUMPS RIDGEWOOD, NEW JERSEY

Defense Dept. photo

This is Greenland, but—except for the icebergs—the ships and imported machines are typical of all island building jobs.



ATLANTIC ISLANDS:

Home for the military

Most Pacific Ocean Islands where U. S.-controlled construction activity is encountered are U. S. territory. Not in the Atlantic. Here, European countries are the landlords, and U. S. activities are governed accordingly.

In dollar volume, the Atlantic islands area accounts for nearly $700 million worth of construction work—all of it being performed by U. S. contractors and all of it connected with the defenses of the United States and its allies.

Except for climate, the working conditions throughout the islands are surprisingly similar: Little or no construction materials are available at the site; little or no local labor or technical help is available; no machinery or other equipment. Some of the engineering is being supplied by the military services themselves—everything else has to be imported, often at considerable cost.

Added to these difficulties is the further one of military secrecy—so tight that in most cases only dollar totals and general descriptions of the jobs can be obtained. That need for security also imposes burdens on the contractor—careful screening of his personnel, sometimes extremely difficult negotiations for supplies and delivery, constant close work with the military.

The jobs in the area include:

• **The Azores**—A $72-million project to build "airfield facilities." Architect-engineer contract is held by a three-firm combine of Frederick Snare Corp., New York; Bowers & Barbalat of Pittsburgh and Antonin Raymond and L. L. Rado of New York. Construction contract held by Snare and Irons & Reynolds of New York.

• **Bermuda**—A $12-million program of construction of airfield facilities, with Amman & Whitney of New York and Capital Engineering Co. of Dillsburg, Pa., as architect-engineer.

• **Greenland**—A huge airbase at Thule nearly completed in a nine-month construction period by a four-contractor combine under the name of North Atlantic Constructors at a cost of $250 million. The group includes: Peter Kiewit Sons Co. of Omaha; S. J. Groves & Sons Co. of Minneapolis; Condon-Cunningham Co., Omaha; Al Johnson, Minneapolis. Architect-engineer was Alfred Hopkins, New York and Metcalf & Eddy of Boston.

More than 100 shiploads of materials and equipment went into the base. 4,400 men worked on its construction, complete services for a sizeable city were installed to service it. Chicago Bridge & Iron Co. supplied and erected 40 large oil storage tanks here, at the rate of one each day.

• **Iceland**—Still under security wraps is the $70-million airbase under construction (now virtually complete) near Keflavik.

Architect-engineer is Wyatt C. Hedrick of Fort Worth. Contractors are Metcalfe-Hamilton-Smith-Beck Companies, with headquarters at Richmond, Va. The combine consists of: Metcalfe Construction Co., Kansas City, Mo.; Gordon Hamilton Contracting Co., Kansas City, Mo.; Smith Engineering Co., Pensacola, and H. C. Beck, Atlanta.

• **Newfoundland**—Five military projects on Newfoundland and its mainland adjunct—Labrador—account for expenditures of more than $267 million.

The jobs are:

Argentia Naval Station—a $2.3-million hangar, under contract to Ayres, Hagen and Booth of Providence, R. I.

Airfield facilities at Goose Bay, Labrador—A $102-million project, under contract to Drake-Merritt of New York City (Johnson, Drake & Piper and Merritt-Chapman-Scott Corp.). Architect-engineers are Fay, Spofford & Thorndike of Boston.

Airfield facilities at Harmon Air Force Base, Newfoundland—A $93-million job under contract to Metcalfe-Hamilton Companies, New York (Metcalfe Construction Co. and Gordon Hamilton Contracting Co., Kansas City). Architect-engineers are Parsons, Brinckerhoff, Hall & Macdonald, Frederic R. Harris Inc., of New York, and Frank Grad & Sons, Newark, N. J.

Air control and warning stations, Labrador and Newfoundland—A $65-million program, under contract to Fraser-Brace-Terminal Constructors, New York City (Fraser-Brace Engineering Co. of New York and Terminal Construction Co., Montreal). Architect-engineers are Seelye, Stevenson Value & Knecht and Shreve, Lamb and Harmon of New York.

Airfield facilities at Torbay and Pepperell, Newfoundland—A $5-million program, under contract to Tower Construction Co. of Pepperell, Nfd. Architect-engineers are O'Connor & Kilham, Praeger-Maguire and Eggers and Higgins, New York.

ECA photo by Pietzsch

AMERICAN ENGINEER instructs a construction foreman on Italy's I.R.O.M. refinery that American firms are building.

EUROPE:

Only specialists need apply

WAGE RATES PER HOUR IN NATIONAL CURRENCY

City	Exch. rate June '53 per $1 Us	Common Labor Hvy. const. 6/53	Common Labor Hvy. const. 6/52	Building 6/53	Building 6/52	Bricklayers 6/53	Bricklayers 6/52	Carpenters 6/53	Carpenters 6/52	Structural ironworkers 6/53	Structural ironworkers 6/52
Amsterdam[a]	?	1.14[ac]	1.14[ac]	1.06[bc]	1.06[bc]	1.242[cf]	1.242[cf]	1.261[cf]	1.261[cf]	1.158[df]	1.158[df]
Athens[gh]	30,000 Drachmae	60,000[B]	———	50,000[A]	———	100,000[C]	———	100,000[C]	———	100,000[C]	———
Brussels[kll]	fr 50	21.15[D]		21.15[D]		23.80[EF]		25.45[EF]		———	———
Copenhagen[m]	6.92 Kr	All rates based on piecework — fixed by tariff. New tariff every two years.									
Frankfurt[e]	? DM	1.84	1.78	1.67	1.61	1.96	1.89	1.96	1.89	1.96	1.89
Geneva[ik]	Sw. frs 4.28	2.47	———	2.47	———	2.95	———	3.07	———	2.95	———
Helsinki[n]	231 Markkaa	130	———	115	———	250[oE]	———	250[oE]	———	250[oE]	———
London[ik]	£0/7/0	0/3/2½	0/3/1½	0/3/1	0/3/2½	0/3/8	0/3/6	0/3/8	0/3/6	0/3/4	0/3/4
Madrid[ik]	10.95 pts	3.10	2.75	3.10	2.75	3.95	3.85	3.85	3.85	3.95	3.85
Oslo[ns]	7.14 N.Cr.	6.50	———	4.90	———	5.70	———	4.65	———	———	———
Paris[ehh]	350 frs	157	157	147	147	188	188	188	188	188	188
Rome[ell]	624.88 lire	258.63	238.25	258.63	238.25	288.25	265.12	317.00	292.37	317.00	292.37
Stockholm[es]	5.18 kr	5-6	5-6	5-6	5-6	7-8	7-8	6.50-7.50	6.50-7.50	5-6	5-6

• **a** no tariff work • **b** tariff work • **c** plus amount equal to pension fund and unemployment insurance now paid by worker • **d** plus amount equal to unemployment insurance paid by worker • **e** 8½-hr day • **f** average for tariff, no-tariff work • **g** 8-hr day • **h** per day • **i** 6-day week • **j** "specialized" labor in all trades • **k** "qualified" labor in all trades • **l** wage rates linked to retail price index. Employers pay addit 29.4% of base rate for social security with ceiling of frs 5000 per month. • **m** standard 7-hr work day in summer, 8-hr day in winter • **n** 46½-hr wk except June-Aug: 45 hrs. • **o** all skilled labor paid piece rate. Rates outside Helsinki are 160-200 m. per hour • **p** 44-hr wk. • **q** approx • **r** contractor pays addit 95% to workers' social insurance fund • **s** 48-hr wk 5.5 hrs on Sat.

Ranges • **A** 40-50,000 • **B** 50-60,000 • **C** 90-100,000 • **D** 19.18-21.15 • **E** 22.30-23.80 • **F** 24.75-26 .45 • **G** 200-250

MATERIALS PRICES IN NATIONAL CURRENCY F.O.B. CITY, JUNE '53 AND JUNE '52

City	Structural steel per ton 6/53	Structural steel per ton 6/52	Reinf. steel per ton 6/53	Reinf. steel per ton 6/52	Portland cement per ton £/53	Portland cement per ton £/52	Lumber 2x4 S4S per M ft bm 1st cl pine 6/53	1st cl pine 6/52	2nd cl pine 6/53	2nd cl pine 6/52	Local equivalent 6/53	Local equivalent 6/52
Amsterdam	435.00[a]	587.50[a]	418.50[a]	567.50[a]	55.50[a]	55.50[a]	———	———	———	———	219.00[bd]	240.50[bd]
Athens	6.000[e]	———	5000[e]	———	400,000[a]	———	1,800,000	———	1,600,000	———	1,500,000	———
Brussels	4,610[aeA]	———	4,610[aeA]	———	665[af]	———	36[eh]	———	———	———	29[el]	———
Copenhagen	884[a]	———	825[a]	———	20.30[f]	———	11.98[k]	———	10.80[k]	———	———	———
Frankfurt	600[a]	750[a]	600[a]	680[a]	75[a]	78[a]	230[d]	280[d]	200[d]	280[d]	180[dl]	210[dl]
Geneva	55.00[mn]	———	57.50[mp]	———	5.40[op]	———	0.90[ep]	———	0.80[ep]	———	———	———
Helsinki	75[cR]	———	69[eC]	———	430[q]	———	43,000[rD]	———	———	———	———	———
London	29/9/6[tv]	28/2/0[tv]	31/18/0[tv]	31/19/0[tv]	4/15/0[tu]	4/16/9[tu]	130[sE]	120[sF]	105[sG]	105[sH]	———	———
Madrid[a]	7720[ax]	7200[awx]	3200[ax]	3000[awx]	382[apbb]	329[ap]	2500[dxI]	2500[dxI]	1500[dxJ]	1500[dxJ]	———	———
Oslo[p]	39.00[aabb]	———	42.50[aacc]	———	6.00[odd]	———	1250[s]	———	1060[s]	———	———	———
Paris	37,300[ap]	35,500[ap]	36,200[ap]	34,500[ap]	3739[a]	3835[a]	11,500[ff]	12,000[ff]	9500[ff]	10,000[ff]	———	———
Rome	75[cx]	112[cx]	8800[mx]	10,300[mx]	1050[mp]	1080[mp]	40,000[dp]	48,000[dp]	33,000[dp]	38,000[dp]	23,000[dp]	30,500[dp]
Stockholm[p]	643[a]	890[a]	591[a]	865[a]	93.80[aJJ]	104.80[aJ]	9.30[k]	9.30[k]	7.10[k]	7.10[k]	———	———

• **a** per metric ton, 2204.6 lb • **b** 1½ x 4-in • **c** per kilogram • **d** per cu meter • **e** at basing point • fob barge, 250 ton lots • **g** per running meter • **h** Scandinavian, 2½ x 7-in • **i** Domestic, 2½ x 7-in • **j** per 170 kg cask • **k** per cu ft • **l** 3rd cl pine • **m** per 100 kg • **n** carlots—less than carlots: Sw. fr 70 • **o** per 50 kg bag • **p** delivered • **q** per 50 kg • **r** 6th cl. pine per standard sawed timber 4.672 cu meters • **s** per 165 cu ft • **t** per long ton • **u** paper in 6 long ton loads • **v** mfr's price fob city. Local merchant's price 6/53: struct stl, 45/0/6; reinf ton, 44/0/6 • **w** approx 100 pts more in black market • **x** fob mill • **y** 25-35 mm diam price of 12-17 mm: 6/53:2900; 6/52:2750. 5-8 mm diam: 6/53 2685; 6/52 2500. • **z** includes 7.4% tax 6/53, 7% 6/52 • **aa** per cwt • **bb** I and channel beams. Add extras for smaller dimensions • **cc** over 10 ton. for 13 mm add 0.50 per cwt. 10 mm: 0.75 per cwt. 6 mm: 2.00 per cwt • **dd** never sold in volume • **ff** maritime—add transport minimum rates • **hh include** 47% addit social charges—insurance, family allowance, etc. • **ii** includes social charges, insurance, pd holidays • **jj** price per 50 kilo sack: 6/53 4.69; 6/52 5.24. Price of lower strength grade cement widely used (regular Portland cement plus economizer material): 6/53, 84.20 per metric ton or 4.84 per 50-kilo sack.

Ranges • **A** 4530-4610 • **B** 70-75 • **C** 67-69 • **D** 42-43,000 • **E** 110-130 • **F** 115-120 • **G** 95-105 • **H** 100-105 • **I** 1500-2500 • **J** 900-1500

The opportunities for U.S. engineers and contractors to participate in the construction affairs of Europe are greater than before the war. But they are not so extensive as many Americans had convinced themselves they would be on the basis of the magnitude of the reconstruction task faced by the European countries.

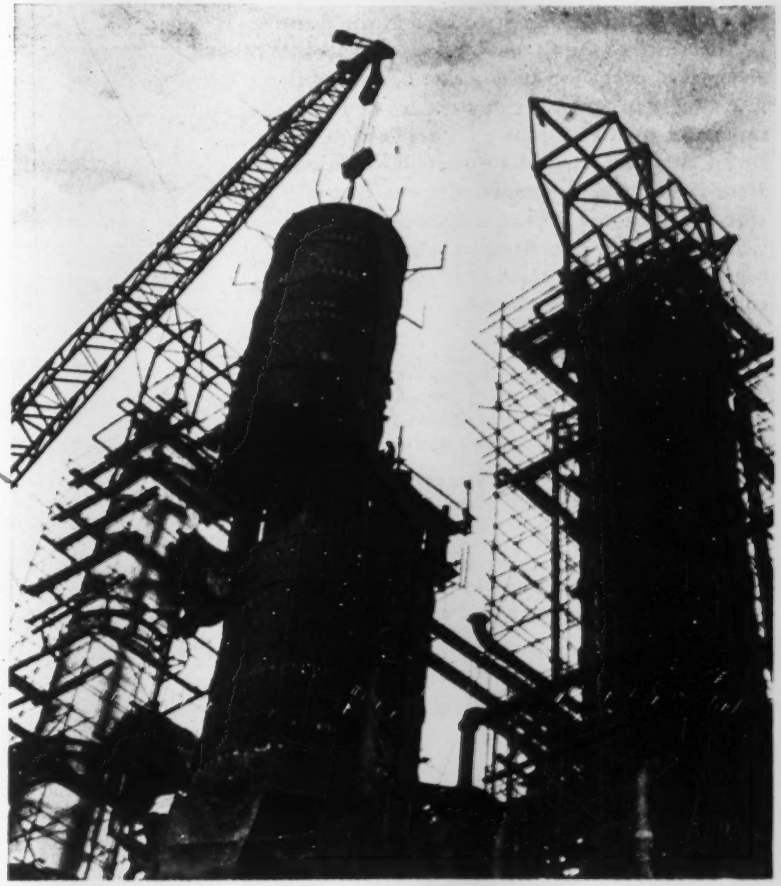
One factor that was overlooked was the high capability of European engineers and contractors to handle the jobs themselves. Another was that political fact of life that leads a country to give preference to its own nationals.

Both factors have worked to keep down the number of U.S. firms and to limit their activities to three main fields: (1) U.S. military installations; (2) highly specialized jobs, such as oil refineries; and (3) consultants to or associates of foreign engineers and contractors who require aid on very special problems—including the purchase and use of American construction equipment.

By and large Europe has been more inclined to embrace the products of U.S. construction equipment manufacturers than the services of U.S. technicians. Even here, U.S. participation is frequently through foreign manufacturing affiliates or subsidiaries. (In isolated cases, too, U.S. design and construction methods have been introduced into Europe through corporations in the different countries.)

It seems certain that the export of construction know-how to Europe will drop off as our military building there is reduced. The specialist consultants and the firms that ally themselves with commercial, financial and engineering interests in the various countries should, however, enjoy a certain continuing demand for their services. And there will be opportunities in some of the under-developed overseas territories of European countries, particularly if payment can be accepted in local currencies instead of dollars.

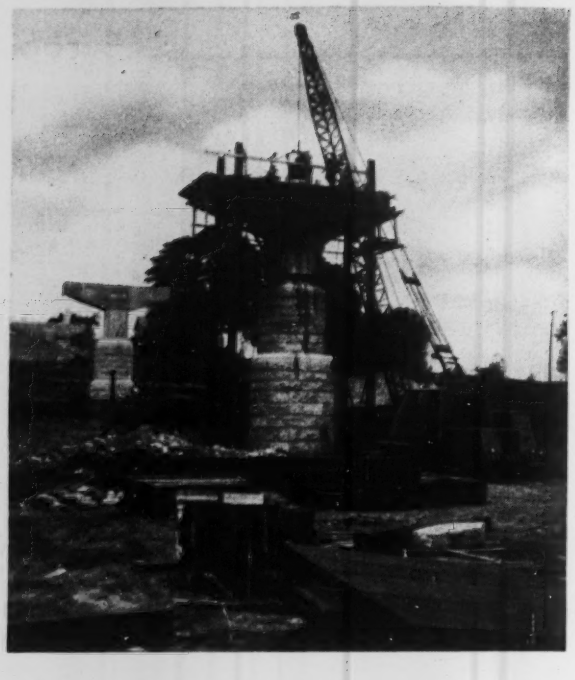
MORE POWER for Athens. Designed and built by U. S. engineering and construction companies, Greece's new Aliveri steam station will be fired by lignite from deposits developed by another American firm.



U. S. design and construction know-how on oil refineries has been needed and welcome in the United Kingdom.

▶ Great Britain

Construction firms or consulting engineers wanting to do business in the United Kingdom must offer something that is indispensable as well as unavailable from U.K. sources. U.S. know-how and equipment have built the British oil refining industry from nothing to over 20 million tons capacity since the war; but, in contrast, even on the airbases destined for our use, British engineers and contractors are in charge. Oil refineries were beyond British ability to build. Airbases could be handled in stride.



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for instance... LONG BOOM for reach– SHORT BOOM for heavy loads–

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- *An accurate, fast, independent boom hoist which raises or lowers boom or boom and load by power only.*
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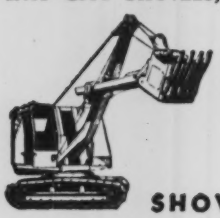
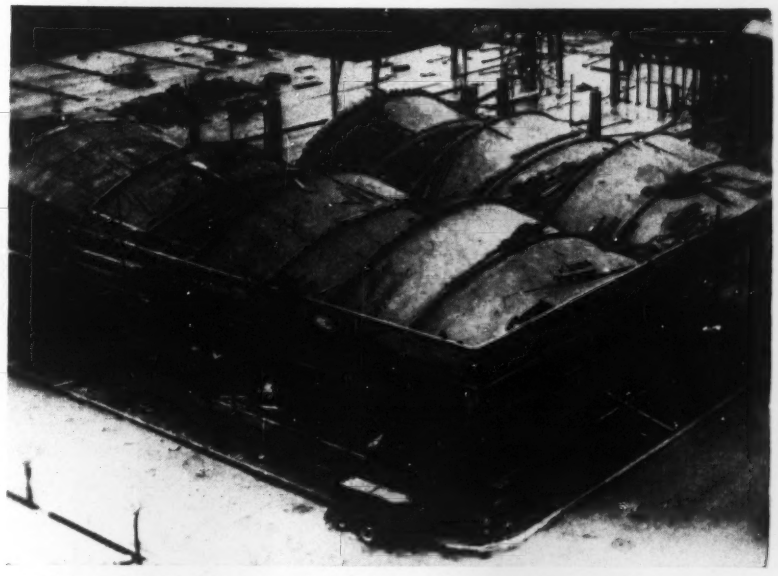


BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS



VACUUM CONCRETE was used for this conoidal roof at Bordeaux, France.

American firms doing business in Britain are sometimes able to operate through branches, but a more frequent device is a subsidiary organized as a limited-liability British company. In either case the bulk of the technical personnel would be British for both political and economy reasons.

There have been cases where an American design team or an individual consulting engineer or architect has been retained on jobs that British nationals could handle, but they have been special and small in number. The British subsidiary of an American firm is also in a better position to get work in the country's overseas territories—and in fact in all Sterling areas—than a firm based solely in the U. S. Being able to accept and use Sterling payments is a considerable advantage.

Those firms able, willing or invited to do business in the United Kingdom would find that permits for projects are still required from the Ministry of Labor and National Service, and that building materials are not in abundant supply—even brick, cement and roof tile.

Both skilled and unskilled labor are, however, available in quantity.

• **Among the best known** American firms presently handling construction business in the U. K. either through branches or subsidiaries are Foster-Wheeler, Kellogg International, The Lummus Co., E. P. Badger & Sons, and Procon, all chemical or oil refinery specialists. Lummus has been particularly active in the design and construction field, doing a styrene plant for the Forth Chemical Co. at Grangemouth, Scotland; a furnace black plant for Cabot Carbon Ltd., Stanlow, England; a complete new refinery for the Vacuum Oil Co. at Coryton; and additions for the Shell Refining and Marketing Co. at its Stanlow and Shell Haven refineries and for the Anglo-Iranian Oil Co. for its refinery in Kent.

E. P. Badger & Sons, affiliated with Stone & Webster, Boston, was the prime contractor on Anglo-Iranian's Kent refinery, and designed and installed some of the units.

PRECAST CONCRETE panels (stacked at left) are being manufactured to a U. S. design by a French contractor for the U. S. airbase at Chambley, France.

Procon Ltd. installed some of the special units of Shell's Stanlow refinery and also at the Kent refinery of Anglo-Iranian.

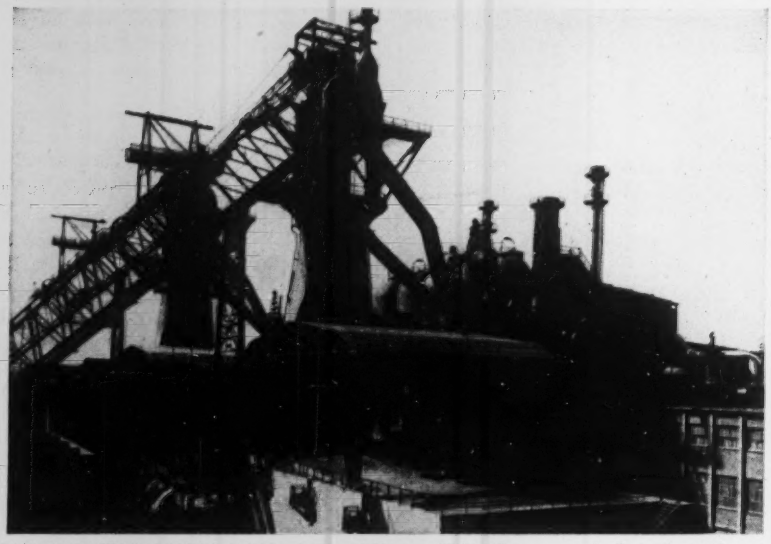
The only American firm announced as doing work on our military installations in England is Richard Hawley Cutting Associates, architect-engineers of Cleveland.

▶ France

France is practically forbidden territory for American construction companies. No U. S. builders are at work in the country today, if exception is made for the three large U. S. contractors who banded together to handle management and supervision on the airbases being built for us by French contractors. Actually, it is stipulated in the 1950 agreement between the two countries that construction of airfields as well as of base facilities for American supply troops across France will be handled by French construction firms.

American consultants fare somewhat better on the military facilities than contractors, and now and then are called in on special civilian problems, such as earthdams. Some American contractors (Morrison-Knudsen, for example) have formed limited partnerships with French firms, largely for foreign operations outside France, but also, it would appear, to aid in the acquisition and operation of American construction equipment for certain French jobs. American engineering firms specializing in the steam power plant and oil refinery fields have also handled a number of jobs for which MSA provided the financing.

• **Generally French law** encourages foreign firms that want to do business in France to form a French corporation with substantial participation of French capital, usually about 50%. A number of American manufacturers of construction equipment operate in France through this sort of corporation, but it is not believed that any American contractor has yet made such an arrangement. Fluor Corp., Los Angeles, has made the nearest approach, joining with a French engineer to form Franco-American Construction Technical Services, known as F.A.C.T.S.-Fluor, to do general design and construction work. Vacuum Concrete, Inc. of Philadelphia is another firm that has organized a French affiliate to carry on its special construction process, not only in France but in other foreign countries. The Preload Company, Inc., New York, also has a French affiliate which designs



ITALY'S NEW STEEL MILL at Cornigliano will be the country's first of continuous type, add 600,000 tons annual capacity. Design and erection supervision are by American firms.

and builds its prestressed concrete tanks.

Basically there is no need for American constructors in France, since the French engineers and contractors are unusually capable, while the larger contractors are also well equipped with machinery. The limiting factor on construction in France is the scarcity of capital for both public and private projects.

In these circumstances it is almost exclusively in the military field that American construction people can be found operating in France today. This work as well as the few other specialist jobs in which Americans have had a part adds up to the following picture.

Military Facilities

• Three American contractors—Raymond Concrete Pile Co., Brown & Root and Walsh Construction Co.—pooled personnel to handle the construction management and general supervision on nine airbases being built for our Air Force by French contractors. Their staff has now been integrated into the European Command's Joint Construction Agency, which is handling all U.S. military construction in France. On these airbases—and on Army supply and service facilities in a zone extending across France from Bordeaux to the Rhine—the following U.S. consultants are providing what might be called owner's inspection of design and construction:

• Parsons, Brinckerhoff, Hall & Macdonald and Walker & Poor, New York, are associated engineers and architects on bases at Evreux and Dreux.

• Seelye, Stevenson, Value & Knecht, New York, and Frank Grad & Sons, Newark, N. J. are associated engineers and architects on bases at Chaumont, Chambley, Toul and Laon.

• Richard Hawley Cutting Associates, Cleveland, is handling the inspection work on bases located at Etain and Phalsburg.

• Atlantic Engineers, New York, a combination of Ammann & Whitney and Guy B. Panero, are the architect-engineers on the base at Chateauroux, and in addition designed the precast concrete barracks buildings that a French contractor is using at the Chambley base.

• Mackenzie, Bogert & White, New York, has done design work for a communications and ordnance maintenance depot at Saran in the vicinity of Orleans.

• Daniel, Mann, Johnson & Mendenhall, Los Angeles, is doing design work for airfield and army base facilities.

• F.A.C.T.S.-Fluor, Los Angeles, has been working on designs of such facilities as hospitals, PX's and petroleum storage facilities.

• Dumont, Greer & Associates is doing general design work and has recently completed the design for the new U.S. Army headquarters to be built near Paris. Although it is a French firm, with no American antecedents, Mr. Greer is an American.

• Foster-Wheeler is the architect-engineer for petroleum storage facilities at Donges, near St. Nazaire, and at Melun and Verdun, as well as for a 400-mile connecting pipeline. The storage tanks have been designed and will be supplied by the Chicago Bridge & Iron Co.

• **In addition to** the jobs connected with our military activities in France, there are a few examples of American participation in French civil construction work.

The French government plans to build a high earthdam at Serre-Poncon in southern France. Several American specialists have already been called in for advice, and it is also stipulated in the call for bids that the successful French contractor must ally himself with a foreign contractor experienced in earth dam building. Some American contractor may well be engaged on this job when it gets under way.

Vacuum Concrete, Inc., Philadelphia, has introduced its special methods and equipment to several large construction jobs in France, through its associate, Societe du Vacuum Concrete. This firm has handled contracts for 6 million sq ft of precast slabs on both the Rhine-Ottmarsheim Canal and on the Donzere-Mondragon Canal. Its process has also been used for the columns and roof of a one-story factory in Bordeaux and for the columns and floors of a nine-story office building in Geneva, Switzerland.

The Preload Co., Inc., New York, operating through a French associate, has built 19 of its prestressed concrete tanks (of which 6 are of over 2 mg. capacity) in France, Algeria and Tunisia.

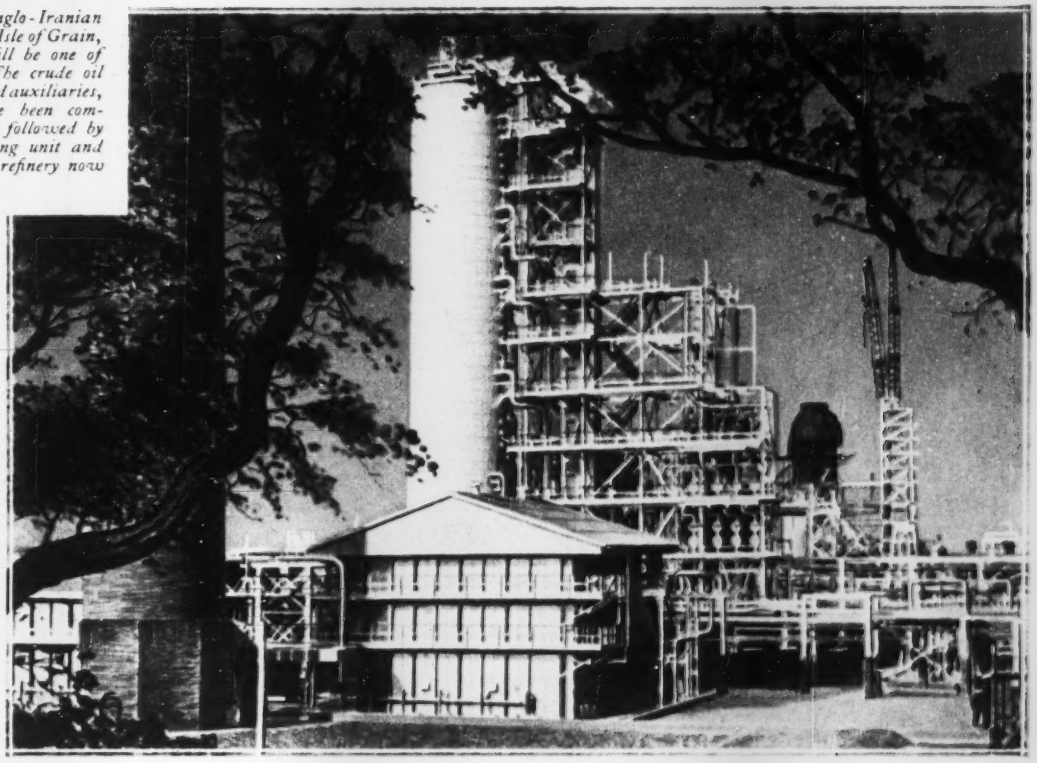
Finally, in the steam plant and oil refinery field, Lummus, Kellogg, Gilbert Associates, Gibbs & Hill, Foster-Wheeler and E. B. Badger, among others, have recently completed or are still carrying on contracts. As is normal on this type of work, too, the suppliers of many of the large items of installed equipment have sent engineers and erection crews to France.

▶ Italy

In contrast to some other countries in Europe, Italy has no governmental restrictions aimed at foreign engineers and contractors. In fact, it might be said that the welcome mat is out for Americans, since the 1948 treaty of commerce and friendship provides for a footing of equality with Italian firms in either public or private construction.

Actually, of course, conditions are not equal because the Italian firms

Kent Refinery of Anglo-Iranian Oil Company on the Isle of Grain, below London, will be one of Europe's largest. The crude oil distillation plant and auxiliaries, shown here, have been completed and will be followed by the catalytic cracking unit and the lubricating oil refinery now under construction.



PLACING RESPONSIBILITY *to* BEST ADVANTAGE

Work of the size and complexity of the new Kent Refinery, incorporating the latest technical developments, requires control and leadership woven together detail by detail.

The Anglo-Iranian Oil Company determined products and processes, then placed the design of certain process units and the overall planning and erection management of the complete refinery in the hands of E. B. Badger & Sons Limited, affiliated with Stone & Webster Engineering Corporation.

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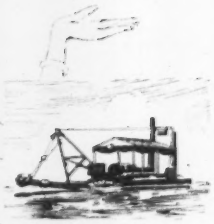
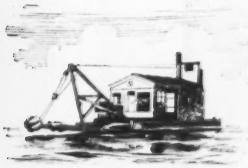
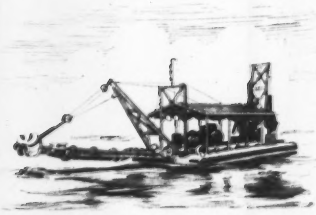
Giant 22" dredge "Musi" operating in Fisherman's Port, Djakarta. To be used for channel and harbor work at Tanjung-Priok and other major Indonesian ports.



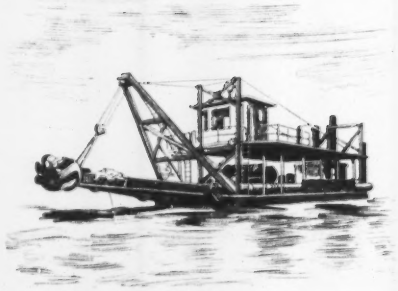
One of 6 Dragon-8's for improving canals. Canals are primarily for irrigation, but also carry small river traffic.



Dragon-10, used for draining lowlands for agricultural use. Four Dragon-10 dredges will be used on this project.



A 12" Portable Dredge is opening a new harbor area near Djakarta. Spoil is used for fill on which factories and warehouses will be built.



16" Portable Dredge at Belawan, Sumatra, is deepening harbor to handle larger freighters. To be used later in up-river channel work.

know their way around in governmental circles, have experience in getting the most out of the large manual labor force, and are versed in utilizing local materials.

Even these disadvantages, however, can be overcome, it is said, if a foreign contractor can operate independent of the Italian financial market. The very high rates of interest charged in Italy (from 10 to 15%) make the Italian contractors vulnerable to competitors who could get money at much lower rates. To offset this advantage, however, there is the law that limits to 6% annually the transfer abroad of the income earned on imported capital, and sets five years as the shortest period within which the imported capital can be withdrawn from the country.

More expressly as to job opportunities, there are vast needs both in the private and public works fields, but grossly inadequate capital to meet them. Housing is high on the list, as are hydro plants, gas pipelines, roads and flood control works.

• **As to other conditions:** There are ample supplies of materials, with the exception of cement which is frequently difficult to get in the north during the working season on the dams and hydroelectric works being built in the mountains. Import permits are necessary for machinery, but these are freely given for U. S. construction equipment. Import duties are at a 25% ad valorem rate. There is a surplus of unskilled labor available, while most skilled workers are employed. Since the last half of 1952, Italian contractors have had to pay a 4% tax on their wage bill.

The overall situation has not been such as to bring any American firm to the country as a prime contractor, but it has not discouraged U. S. consultants and designers, who have played a part in Italy's steam power plant and industrial building expansion since the war. (In line with the need for financing, most of this work has been connected with dollar loans from our ECA and lately from the MSA.)

• **In the industrial plant category,** Arthur G. McKee Co., Cleveland, and the Armco International Corp., Middletown, Ohio, have designed and master-minded the construction of Italy's first continuous cold strip steel mill with an annual capacity of 600,000 metric tons. Covering a one-million sq meter site, of which nearly three-quarters is filled seacoast land, this plant at Cornigliano will increase

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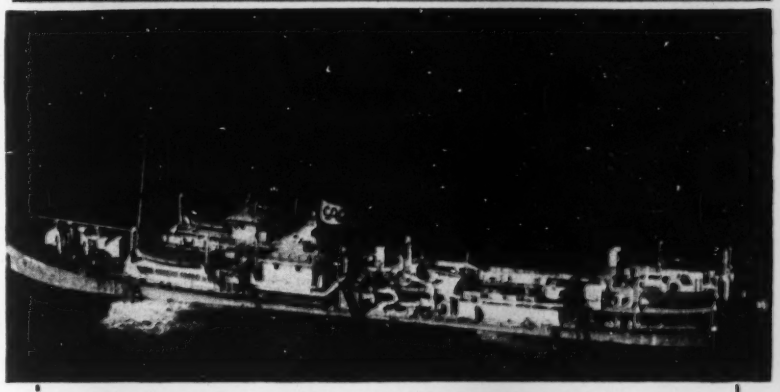

★ In the construction of the New Jersey Turnpike and two runways for Newark Airport, the efficiency of the Sensibar Patented Method with cost saving results, was again demonstrated. A saving of 12% of the total cost of both projects was realized. Picture shows hopper dredge "Sandchief"—one of Construction Aggregates four vessels of this type—at work removing 11 million cubic yards of sand from the bottom of the Atlantic Ocean as fill-in for marshy areas. C. A. C.'s hopper dredges are both hydraulically self-loading and hydraulically self-unloading.

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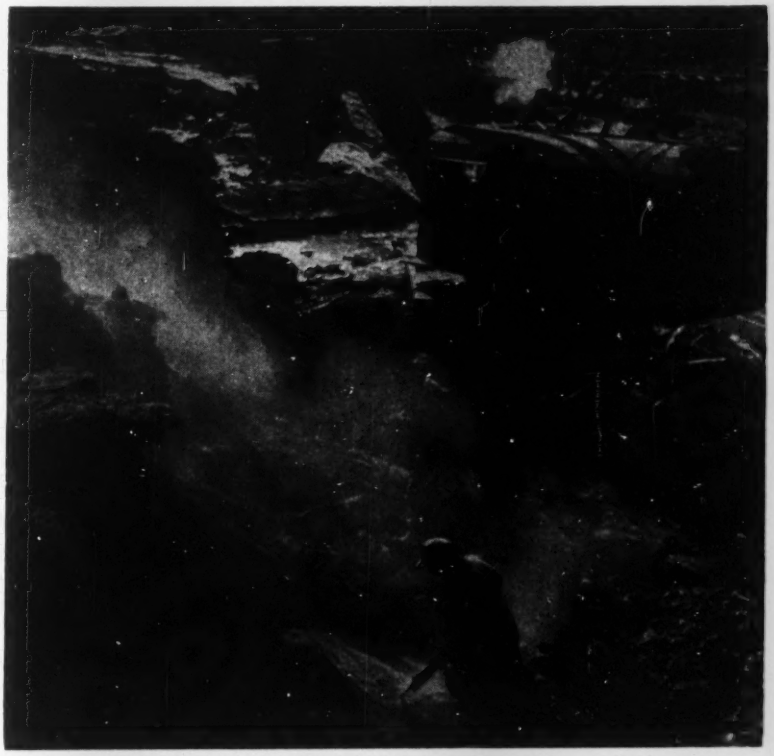

U. S. CONSTRUCTION EQUIPMENT has made a vital contribution to many European construction jobs. This one is the Kaprun hydro project in Austria. Here, as on jobs in many countries, equipment manufacturers' engineers have been the principal purveyors of U. S. technical aid.

the country's steel capacity about 20%. The plant is part of Italy's plan to spend $200 million on steel expansion by the end of 1954. American firms that supplied close to $30 million worth of machinery for the plant also acted as consultants and supervisors for the sections of the layout where their machinery was placed.

• **It is in the field of thermal power,** however, that most U. S. activity is evident:

• Kuljian Corp., Philadelphia, in association with an Italian firm (the Spiti Co.) has designed and supervised the construction of a 90,000-kw steam plant costing $15.5 million at Palermo, Sicily.

• Gibbs & Hill, New York, has handled plant layout and general supervision for two 120,000-kw stations for Societa Edison of Milan. One, located at Genoa, will cost $22 million, the other, at Piacenza, $17 million. The same U. S. firm is designing a 90,000-kw plant, costing about $20 million, for the Societa Meridionale di Elettricita at Naples.

• Gilbert Associates, Reading, Pa., is in charge of design and exercising general supervision on a 60,000-kw station at Civitavecchia for the Societa Termolettrica Tirrena. Total cost $11 million. This engineering firm is also serving in the same capacity on a $20 million, 60,000-kw station at Turin for the Societa Idroellettrica Piemonte.

• Ebasco Services, Inc., New York, is designing and supervising the construction of a 37,500-kw steam plant, costing $8.4 million, for the Azienda Elettrica Municipale of Turin.

• Giffels & Vallet, Detroit, is providing engineering services for the expansion of the Fiat Motor Works at Turin.

• Foster-Wheeler and M. W. Kellogg are furnishing designs and technical services for the I.R.O.M. oil refinery at Porto Marghera.

The only American construction industry representative known to have a part in Italy's extensive hydroelectric development is Vacuum Concrete, Inc., whose European subsidiary is cooperating in the casting of large size concrete penstocks for the Mucone and Volturno hydro plants. Some of the precast units are believed to set a record for size, being 14 ft in diam, 15 ft long and 1 ft in wall

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▸ Greece

Since the war American engineers and contractors have exerted a more influential effect on the construction affairs of Greece than of any other foreign country. This is because our military and economic aid programs provided the funds for needed reconstruction and development, and because there was practically no Greek construction industry left to carry a part of the load.

The first American engineers to arrive on the scene in 1947 were those of the American Mission for Aid to Greece and of the U. S. Army's Corps of Engineers. In implementing programs that they formulated, the following American firms have handled work in Greece:

• Johnson Drake & Piper, New York; Guy F. Atkinson, San Francisco; and Starr, Park & Freeman, New York, a joint contract to rehabilitate railroads, highways and bridges.

• Grove, Shephard, Wilson & Kruge and J. Rich Steers Co., New York, a joint contract to rehabilitate ports and reopen the Corinth Canal.

• Knappen, Tippetts, Abbett, McCarthy, New York, a series of consulting contracts, including:

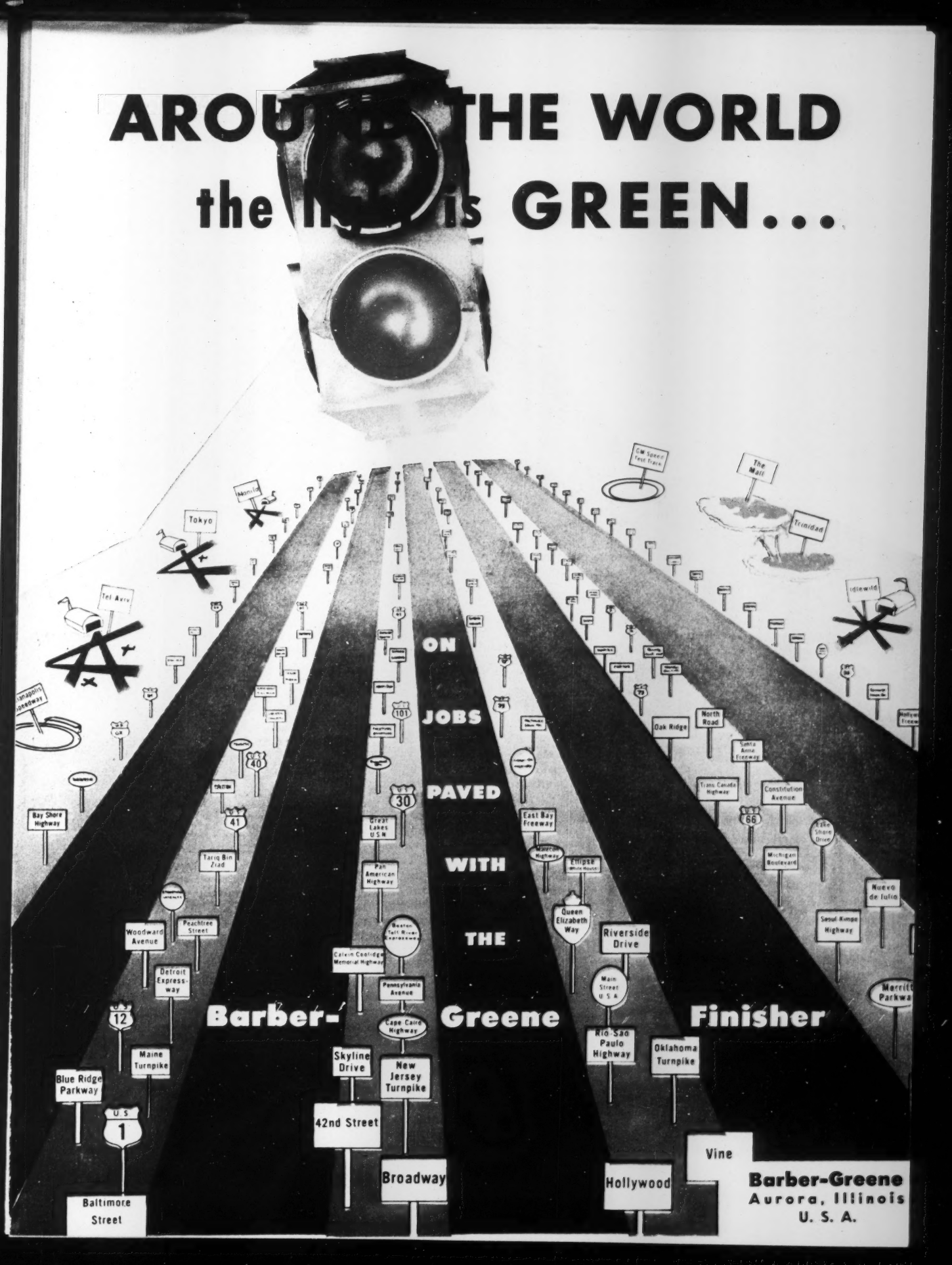
(a) Designs and specifications for the port rehabilitation work

(b) In association with Ebasco Services, a report on the hydro and irrigation possibilities on the Vodhas, Acheloos, Ladhon and Louros projects

(c) Surveys, engineering studies and final designs for ten reclamation projects on the Greek mainland and in the Peloponnesus. The program includes dams, irrigation works and five small hydro plants. Included is a 160-ft earthdam and a 285-ft concrete buttress dam. Total cost is estimated at $133 million

(d) Report and preliminary plans for the development of the Megdova River in west central Greece for hydro power. Includes a 155-ft high earthdam and a power plant with a 1,400-ft head

• Ebasco Services, Inc., engineering and economic study for a comprehensive power system for the country, and final design plans on four of the recommended plants, all of which are now being built under Ebasco construction supervision. One of them, Aliveri, is a steam station of 80,000-kw to serve the vicinity of Athens, while the others are hydro installations located at Ladhon, Agra and Louros. Included also is a long system of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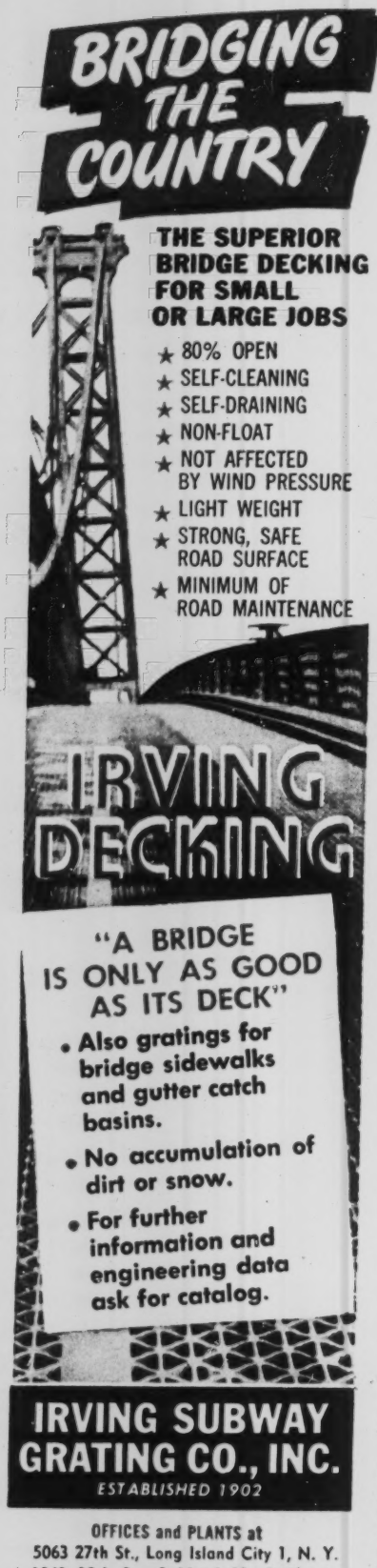
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transmission lines and necessary substations. Construction of the steam station is being handled by Americans, while the hydro plant and transmission line builders are from Italy, France and England.

• Burns & Roe and The Foundation Co. of New York, associated in building the Aliveri steam power plant.

• Pierce Management, Inc., Scranton, Pa., developing lignite deposits to be used as fuel at the Aliveri power station, and also making a study and report on other lignite deposits in northern Greece. Among the facilities required are roads and briquetting factories.

Future Opportunities

Depending upon the availability of capital, the projects included in the KTAM and Ebasco reports represent future opportunities for American engineers and contractors in Greece. In addition, MSA is said to have reported favorably on a large irrigation project in the Plain of Evros in Thrace in which both Greece and Turkey would have an interest and in which is included a bridge connecting the two countries. Finally it has been reported that financial interests brought together by Spyros Skouras, the American theater owner, have proposed building some sugar and oil refineries in Greece.

Reflecting favorably on these opportunities for further participation in Greek construction by Americans, there is every indication that the Greek government will provide all possible encouragement, including modification of any laws and regulations that might be disadvantageous to foreigners.

There is no bar against American constructors, but for a variety of reasons—local competition, capital shortage and a lack of sufficiently large contracts—there are no Americans working within their borders. That's not to say that Americans may not be interested in jobs in these countries. Thus here are thumbnail reports of conditions:

▸ Austria

Imports are subject to permits granted by the Ministry of Commerce, and local taxes on general business have been increased from 3% in 1951 to 5.2% this year. Foreign contractors are required either to apply for an Austrian license, and then operate as Austrian concerns; or must establish connections with established Austrian companies. Foreign labor can be employed only with permission of labor offices in the various provinces.

Supply of building materials is considered excellent, and there is an ample supply of both skilled and unskilled labor and technically-trained personnel. Building cost indexes, which reached a peak in 1951, have shown slight declines or leveling since that time.

American equipment manufacturers have aided in setting up the construction plant for the Kaprun hydro project, largest in the country, but otherwise no U. S. technical know-how has been used since the early reconstruction days when our Army Engineers provided considerable help.

▸ Belgium

Local observers point out that although there is nothing to prevent foreign firms from bidding on work, there aren't enough contracts of sufficient size in Belgium to attract outsiders.

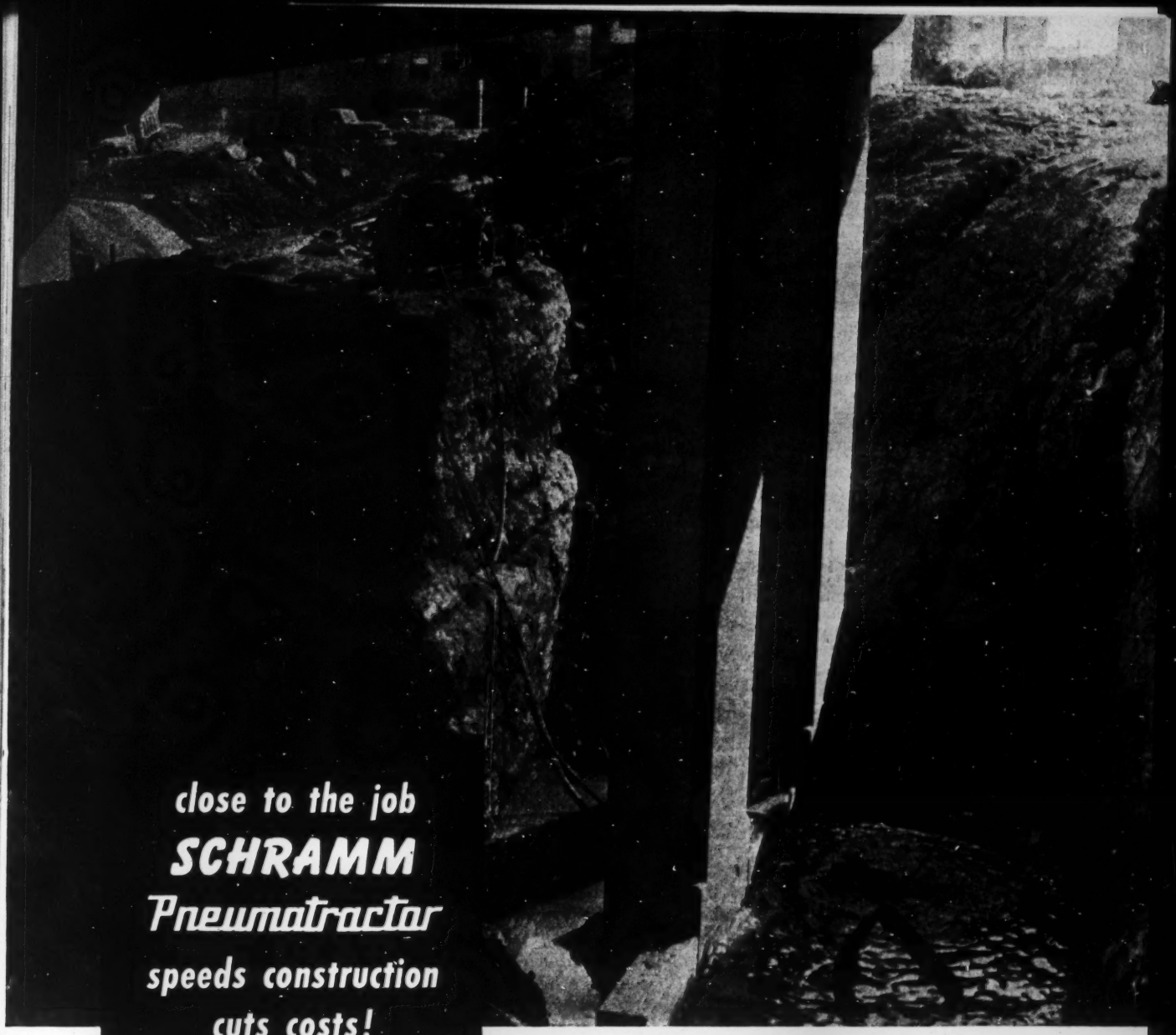
Any foreign firm obtaining a Belgian contract would be required to register on the local commercial register—a procedure that would bring it under Belgian tax laws. Non-Belgians employed on such jobs must have either a working permit or a professional card—which won't be granted unless it can be shown that comparable personnel cannot be obtained locally. Further, non-Belgian workers must also have a residence permit (if they remain more than a month)—and these permits are issued by still another branch of the government. Finally, there is difficulty in converting Belgian payments into dollars.

Wage scales are pegged to the official retail price, and vary somewhat from month to month. Prices of materials—particularly structural steel—have risen substantially with the opening of a common market under the Schumann Plan, up $6.60 per metric ton in two months.

▸ Denmark

Like other European countries, Denmark offers no particular obstacles to U. S. people, but competent local organizations and normal restrictions on foreign operators have meant that there's no work at present for anyone but Danes.

Denmark requires no license for the practice of contracting, but "work-and-stay" permits are required of foreigners. Foreigners would be subject to the same taxes as local organi-



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OVERSEAS AND DOMESTIC PROJECTS TOTAL 363!

During 1952 Intrusion-Prepakt, Inc. and the Prepakt Concrete Company undertook 363 projects of all types and sizes. A total of 327 were executed in the United States and Canada, while the remainder were from the overseas areas of Europe, North Africa and the Caribbean.

RAILROAD AND HIGHWAY BRIDGES — 129

Piers, retaining walls and abutments for new bridges; underpinning, stabilization, restoring and encasing of foundations; replacement and strengthening of piers.

DAMS, LOCKS, PIERS AND DOCKS — 101

Mass concrete above and below water; embedding scroll cases, gate guides, etc.; cofferdam seals; grout curtains under dams and cofferdams; construction facilities. Refacing and restoration; additions; foundation stabilization.

TUNNELS AND PENSTOCKS — 37

Construction of tunnels and penstocks. Relining, restoring and grouting of lined and unlined tunnels by Intrusion-Prepakt methods—no traffic interruptions.

FOUNDATIONS AND PILES — 38

Construction, replacement and stabilization of foundations for heavy equipment, public buildings, industrial plants, mooring dolphins, residential units, grain elevators, power plants and power line towers, and stabilization of highway subsoil.

OTHER INTRUSION-PREPAKT INSTALLATIONS — 22

Prestressed inertia blocks, extra-heavyweight concrete, radiation shielding, general concrete maintenance of buildings, tanks and facilities, encasing timber piles, and other services including soil sampling, core drilling, underwater inspections and government research programs.

OVERSEAS OPERATIONS — 36

A wide range of concrete construction and restoration projects were completed in the following countries: Sweden, Finland, Norway, Germany, France, Italy, Austria, Switzerland, Spain, England, North Africa, Haiti and Cuba.

84% OF THESE PROJECTS ARE FROM REPEAT CUSTOMERS

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zations. Construction activity generally is higher than 1952; supplies of materials just about cover needs; skilled labor supply is very tight.

▸ Finland

Seriously affected by a shortage of money—direct result of Finland's dwindling exports to the West—Finnish construction men have already experienced (last winter) some unemployment. Despite this fact, however, construction activity has managed to hold at about the level of 1951 and 1952.

Materials supplies are adequate—there is even a surplus of cement. Building generally is still a matter for manual labor, machinery being employed almost exclusively for very large plants and power stations. There's no shortage of labor. In efforts to keep up activity, the government issues licenses for all construction work, requiring scheduling to insure work throughout the year. Taxes on materials for residential construction are expected to be dropped to encourage work.

Evidence of Finland's concern over the health of the construction industry is the monthly construction cost index maintained by the Bank of Finland. The index measures costs of a brick dwelling in Helsinki, considering wood, stone, metal, insulation, labor wages, contracting costs, expert's fees, and interest on capital. This index has held steady at 100 (base year 1951) for the first five months of 1953, bank states.

▸ West Germany

No restrictions on U. S. firms, plenty of labor (both skilled and unskilled), construction activity at a higher level in first six months of this year than in the same period of 1952. The supply of building materials is considered good, and a government price index (based on wages, raw materials, interest on loans, administrative and supervisory expenses, 1936 = 100) has been dropping steadily, from 236 in May 1952 to 229 in February, 1953 (latest figure available).

Jobs to be done, however, are still largely reconstruction, and offer little inducement for U. S. contractors. This would be true even for the buildings proposed to be built by the U. S. State Department, in a program now before Congress, although American architects and engineers might play some part in the projects.

▸ Netherlands

Aggressive Netherlands construc-

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Europe

tion companies have ample capacity to handle all local work. Labor is fairly tight, but comparatively low-paid; the nation has funds to pay for its work. Construction material supplies are good; residence permits are required for foreigners working in the country.

Observers point out, however, that if U. S. contractors were to get a job that required import of skilled labor, the project probably would be so important that permit regulations would be relaxed.

Big jobs afoot now include: Continuation of reclamation of the Zuider Zee; reconstruction and strengthening of the dike system; a vehicular tunnel under the River Y at Amsterdam—all handled by Dutch contractors.

▸ Portugal

Portugal engaged an American firm, Krappen, Tippetts, Abbett, McCarthy, in 1951 to survey the navigation and power potential of the Douro River Basin. KTAM recommended construction of seven main river and four tributary stream power installations, with a capacity of 420,000 kw, to cost an estimated total of $130 million. Detailed design of the first dam is now in progress.

▸ Spain

Supply of building material is called "fairly good", though still under tight government control. Skilled labor is scarce, and labor wages are subject to a complicated set of laws that increase the apparent cost considerably (see ENR May 14, p. 40). American engineers and contractors have been eyeing Spain for jobs in connection with a projected system of U. S. air and naval bases there. But continuing delays in effecting an agreement with Spain have made the opportunities questionable.

▸ Sweden

With the exception of industrial work (which dropped about 40% in the first half of this year), construction is running at about the same level as in 1952. This despite a continuing rise in costs which is already beginning to affect Sweden's all-important export industries.

Labor is in short supply, material supply just adequate. The only restriction on imports is the recurring dollar shortage.

Although foreign workers may legally come in to Sweden (under tight permit restrictions) labor unions have uniformly opposed such moves.

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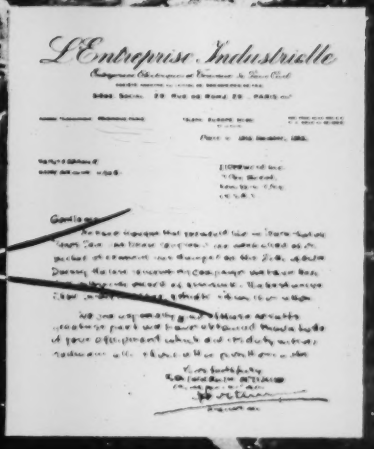
Europe's tallest dam Lidgerwood cableways

were used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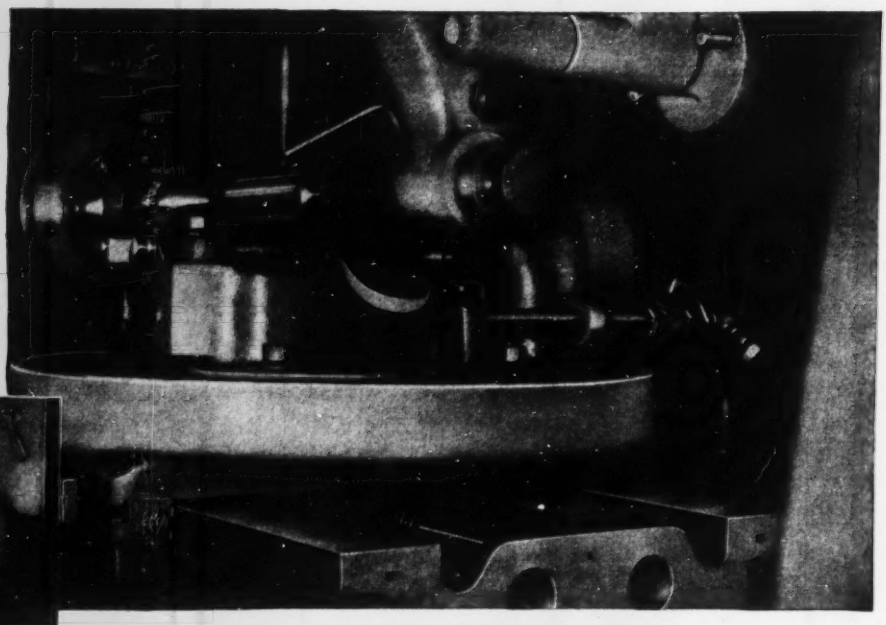

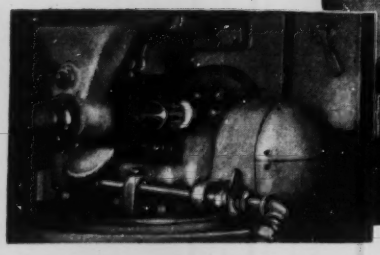

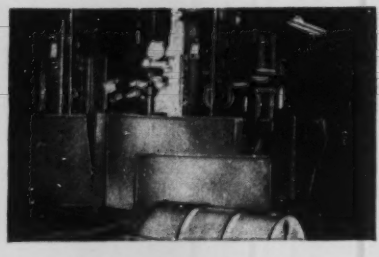

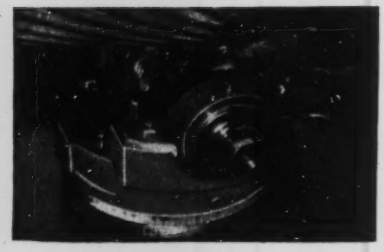

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In an effort to reduce tool wear and cut manufacturing costs, the Wisconsin Division of Timken-Detroit Axle Company at Oshkosh called in Cities Service Engineers to make "on-the-job" tests.

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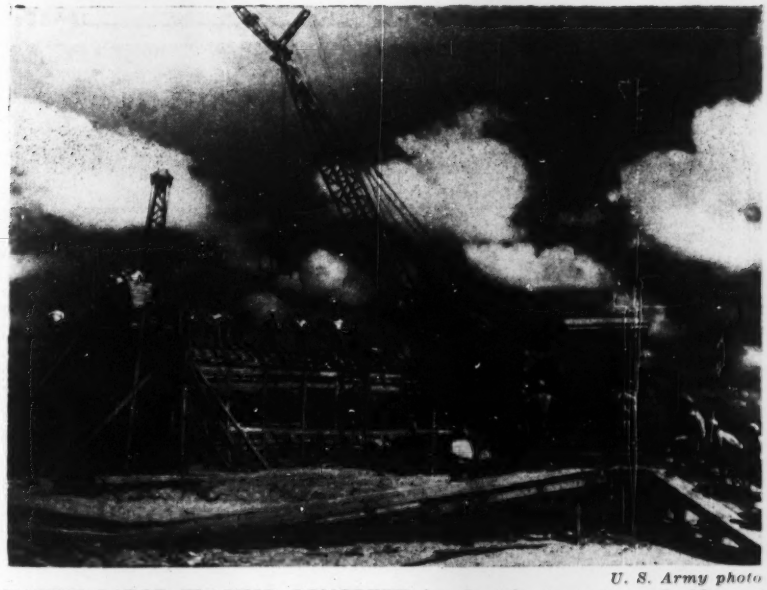


U. S. Army photo

NATIVE LABOR PLACING CONCRETE for the igloo-type storage building of reinforced concrete (for U. S. Air Force Base at Wheelus Field, Tripoli, Libya) uses American machinery and equipment under U. S. supervision.

AFRICA:

Competition for certain

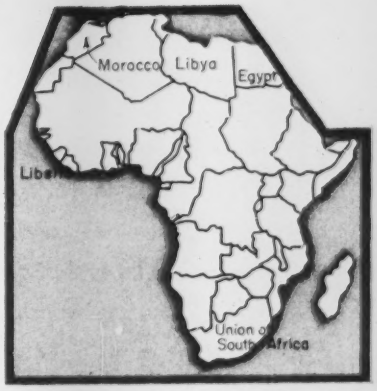
Under the shadow of the European nations that dominate much of its great area, Africa so far offers few bright spots for U. S. builders—and these glow only where we are building airbases, in French Morocco and Libya. Elsewhere—except for Liberia and Ethiopia—American engineers right now don't have an even chance against the competition.

There are great construction works under discussion on the continent: Huge plans for interconnecting the railways across the relatively narrow waist; port and harbor works; plans for industries to supplement the predominant farming, diamond and metals-mining, and exporting of raw materials. But most of this work is virtually closed to Americans.

In most of Africa there is little shortage of materials or labor reported, and few restrictive laws. But by long custom, and by the economics of contact with Europe—the jobs go northward, not to the west.

• **Showcase for U. S.** construction men—despite the abortive Congressional investigations—are the huge airbases they've built and are building in French North Africa.

Working under emergency conditions and complicated relationships with local and French authorities and suppliers, the five contractors combined as Atlas Constructors have nevertheless succeeded in making good progress on the program of four bomber bases and one fighter base that will involve a total expenditure of about $400 million.



The U. S. architect-engineer setup on the work goes under the name of PUSOM—a combination of Porter & Urquhart and Skidmore, Owings & Merrill. The Atlas combine is made up of Morrison-Knudsen Co., Inc.; Bates & Rogers Construction Corp.; Ralph L. Mills Co., Inc.; Blythe Bros. Co., and Nello L. Teer Co.

WAGE RATES PER HOUR IN NATIONAL CURRENCY

City	Exch. rate June '53 per $1 US 6/53	6/52	Common Labor Hvy. constr. 6/53	6/52	Building 6/53	6/52	Bricklayers 6/53	6/52	Carpenters 6/53	6/52	Structural ironworkers 6/53	6/52
Cairo, Egypt[ab]	£E	0.35	0.45	0.65	0.25	0.30	0.90	1.05	0.90	1.00	0.70	1.15
Durban, So. Af.[g]	85[d]		2/2/1	———	2/2/1	———	13/6/8[h]	———	6/11/0[i]	———	———	———
Johannesburg, So. Af.[c]	85[d]		0/1/5-½[e]	0/1/4-¼[e]	0/1/5-½[d]	0/1/4-¼[d]	0/7/6.92[h]	0/7/1[h]	0/7/6.92[h]	0/7/1[h]	———	0/7/1[f]

• **a** per day • **b** 8-hr day • **c** 5-day week • **d** 8-1/5 hr day • **e** 9-1/5 hr day • **f** 8-4/5 hr day • **g** minimum rates per 40-hr week including cost of allowance • **h** artisans. No separate classifications for bricklayers, carpenters, or SIW • **i** apprentice 5th year

MATERIALS PRICES IN NATIONAL CURRENCY F.O.B. CITY, JUNE '52 AND JUNE '53

City	Structural steel per ton 6/53	6/52	Reinf. steel per ton 6/53	6/52	Portland Cement per ton 6/53	6/52	Lumber 2x4 S4S per M ft bm 1st class pine 6/53	6/52	2nd cl pine 6/53	6/52	Local equiv. 6/53	6/52
Cairo, Egypt	44.00[a]	53.00[ab]	44.00[ac]	53[abc]	4.80[ad]	5.05[ad]	26.50	30.00	25.50	26.00	16.00	18.00
Durban, Natal, So. Af.[bg]	33/0/0[eiB]	———	2/8/0[f]	———	0/5/2.5[f]	———	0/14/0[k]	———	———	———	•	———
Johannesburg, So. Af.	36/0/0[egA]	31/0/0[eg]	32/0/0[eg]	32/0/0[eg]	0/4/5[f]	0/4/5[f]	0/2/7[h]	0/3/5[h]	0/2/7[h]	0/3/5[h]	0/2/1[h]	0/2/1-½[h]

• **a** per metric ton no. 4.6 lb • **b** add £2 per ton for imported • **c** ¾-1 in. diam. price per t for 3/16 in. diam: 6/53, £57 per ton; 6/52, £65 per ton • **d** quick-drying, high-grade: 6/53, £5.30 per ton; 6/52, £6.15 per ton. • **e** per short ton, 2000 lb • **f** per 94-lb bag local • **g** imported, fob coastal port, for struct. steel: 6/53, £36; 6/52 £30 per ton • **h** 9x3 in., per running ft • **i** per cwt • **J** plus extras • **k** per cu ft, imported • **l** none in quantity of requisite quality

Ranges: • **A** £32-£36 • **B** £32-£33

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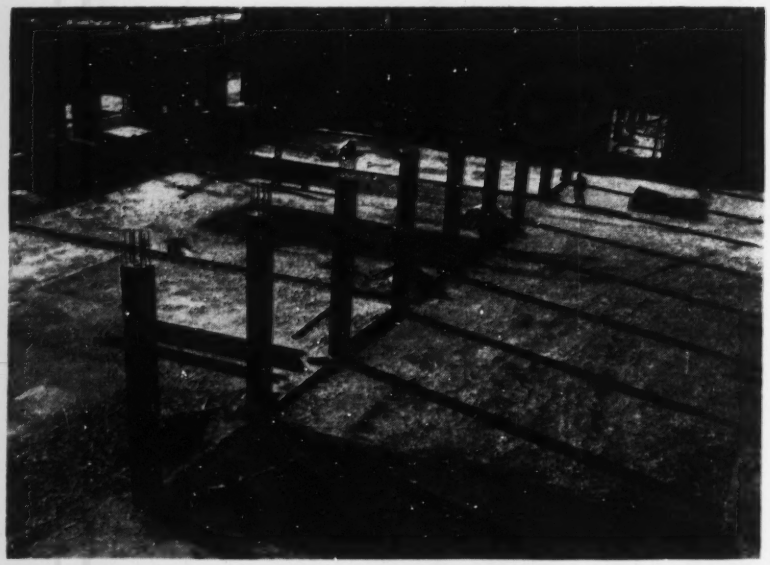

WAREHOUSE CONSTRUCTION at Wheelus Field, Tripoli, Libya, combines the old and the new: North Africa's timeless method of building in stone quarried in the desert combines with reinforced concrete columns to support of roof and with machine-polished, concrete floor slabs to take the heavy load of stored goods.

• **In Libya,** there is the $58-million Wheelus Air Force Base at Tripoli on which Knappen-Tippetts-Abbett-McCarthy are architect-engineers; Crow-Shepherd-Steers Companies, New York, are contractors. (The C-S-S group is made up of W. L. Crow Construction Co. and J. Rich Steers, New York and Shepard Construction Co., Atlanta.)

Other bright spots include the following countries:

• **Liberia,** where Raymond Concrete Pile Co., Inc., of New York built a $20-million port for the capital city of Monrovia, and where the Firestone Tire & Rubber Company—in connection with its large plantations—is carrying on continuing programs that include roadbuilding, sanitation, housing.

In Liberia, at present, the consulting firm of Hazen and Sawyer of New York has designed and is supervising construction of a complete waterworks and sewerage system for Monrovia.

(*Continued on page* 80)

DISTRIBUTION RESERVOIR, of 600,000 gal capacity, is being built in Monrovia, Liberia, by native labor under U. S. construction supervision. Monrovia's whole water supply system is undergoing enlargement and reconstruction.

contractors say:

"ADAMS Creeper Gears* best thing ever put into a motor grader"

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Make your next motor grader an

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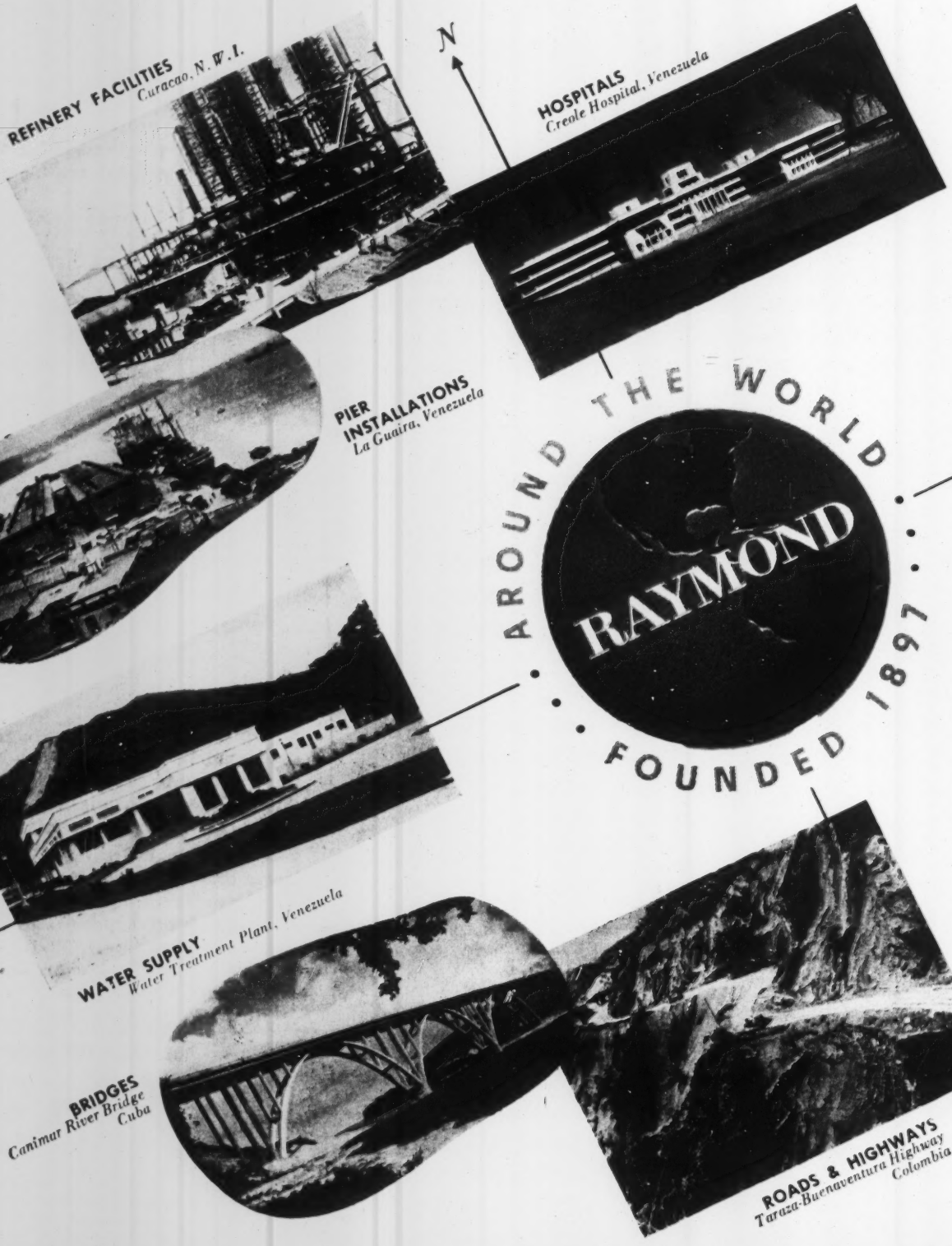

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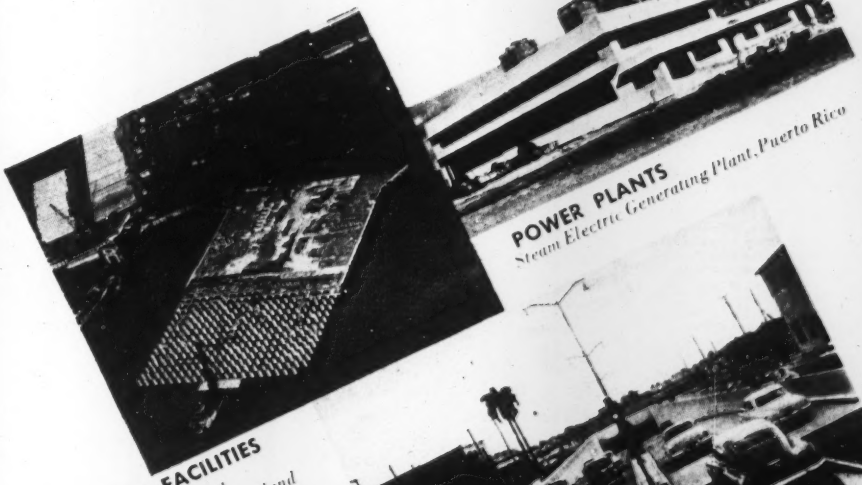
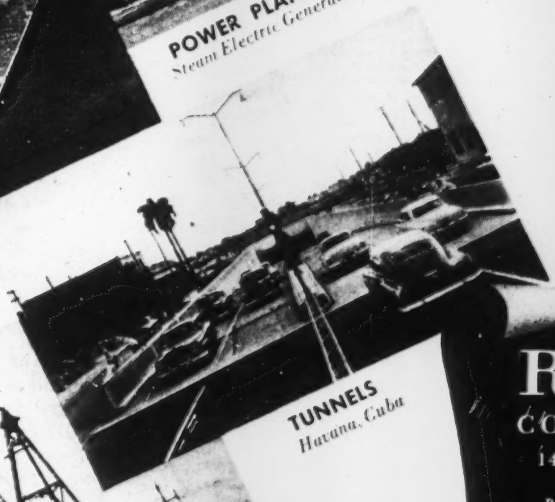
HARBORS
Free Port of Monrovia
Liberia

DRYDOCKS
Curacao, N. W. I.

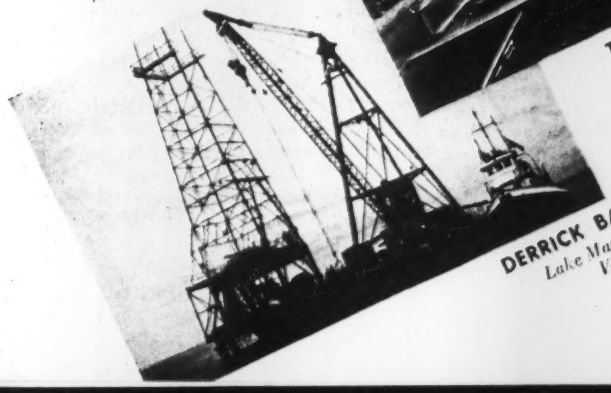


POWER PLANTS
Steam Electric Generating Plant, Puerto Rico

PORT FACILITIES
Ocean Terminal
Auckland, New Zealand



TUNNELS
Havana, Cuba



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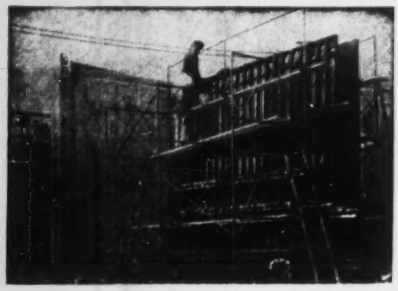
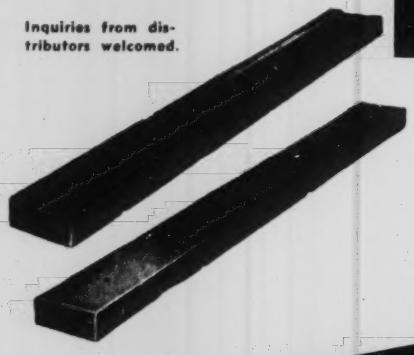
Can be set up, stripped, cleaned, moved and reused in far less time than wood. You don't buy new forms for every job.

Inquiries from distributors welcomed.





Lightweight, easy to handle. No heavy bracing needed. Just send us plans of the job. *LET US SHOW YOU HOW TO SAVE REAL MONEY* on Form Work. Write *Dept. NR-6.*

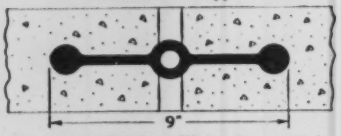
IRVINGTON FORM & TANK CORP.

20 VESEY STREET, NEW YORK 7, N.Y.

Servicised Molded Rubber WATERSTOP

FOR EXPANSION JOINTS

Center Bulb Type

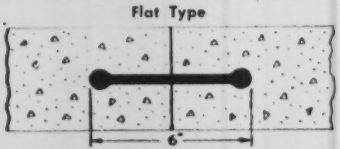


Servicised Rubber Waterstops meet all standard engineering specifications. Made of durable, elastic, cured rubber compound.

Both types available in 6", 9" and 12" widths in any required length.

FOR CONSTRUCTION JOINTS

Flat Type



Write for the Servicised Products Catalog. Sent without obligation.

SERVICISED PRODUCTS CORP.
6051 W. 65th ST. • CHICAGO, ILL.

Need Holes In Concrete?

GET 50% MORE HOLES WITH TERMITE DRILLS!

Penetrate toughest concrete with less pressure and with less drill wear with TERMITE DRILLS Pulverizing action eliminates objectionable noise. Exclusive construction gives you cleaner, more accurate holes in less time and at less cost. Use with standard electric drills or air motors.

Free Factory Resharpening

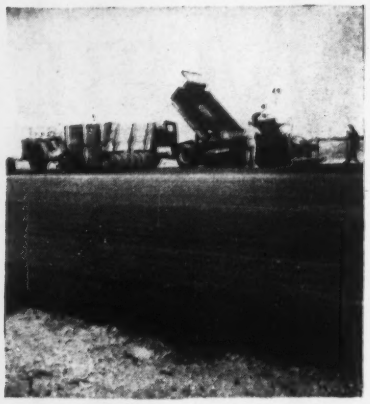
Write for FREE literature and prices

TERMITE DRILLS

Lengths up to 36" Standard diameters from 3/16" to 5" Other diameters up to 8" on special order.

TERMITE DRILLS, INC.
96 N. Lotus Ave., Pasadena 8, California

Africa



PAVING AND ROLLING RUNWAY of one of our new airbases in French Morocco is being done by U. S. machinery and mechanics.

• **Ethiopia,** where Emperor Haile Selassie has called in U. S. consultants from the Bureau of Public Roads. He wants the consultants to help him lay out a system of highways to tie together his empire.

• **Mozambique, Southern Rhodesia,** where a report has been made by Knappen, Tippetts, Abbett, McCarthy on rehabilitation and extension of the railway system—including recommendations that $50 million be spent as a first step in the program to start construction of new trackage, and for rolling stock.

• **The Union of South Africa,** where two major projects are under way, involving Americans: A Standard Caltex refinery in Durban, being built by Foster-Wheeler Co. of New York; and part of a plant for the conversion of coal to oil, which is being built near Vereenigin by the M. W. Kellogg Co., of New York.

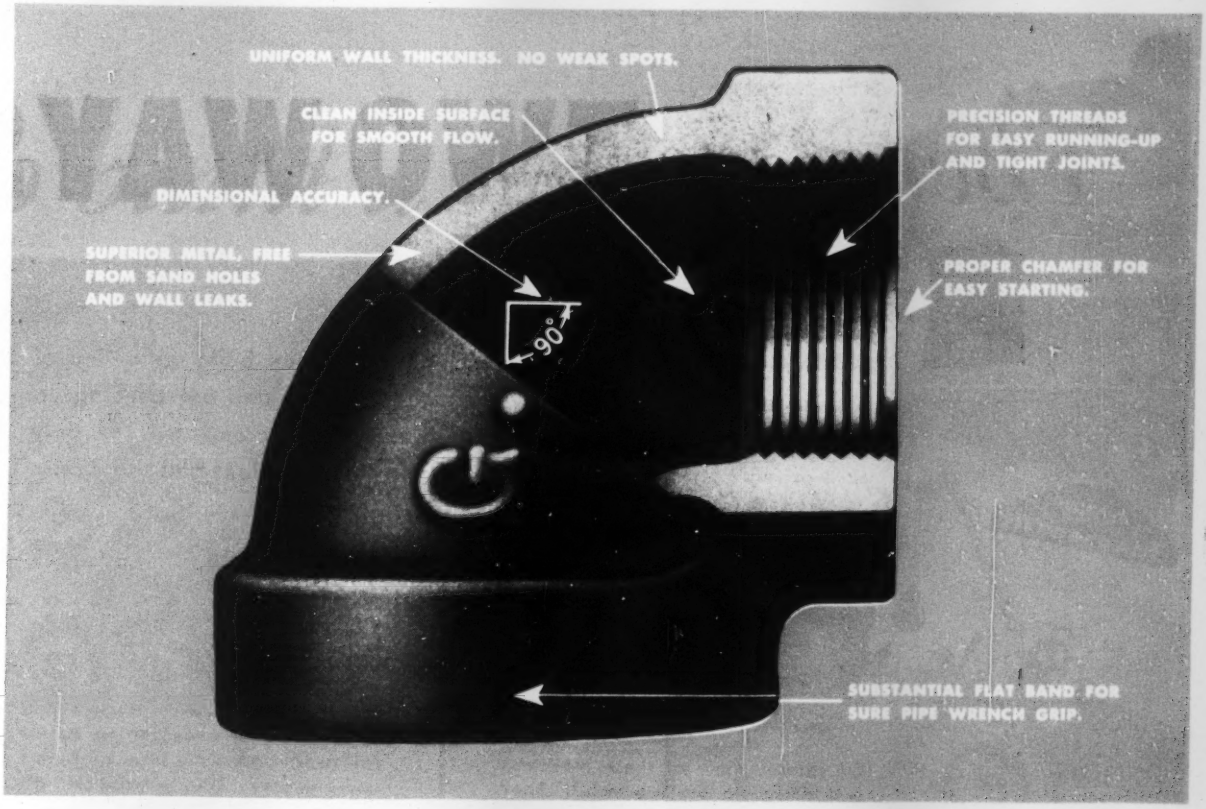
• **French Morocco** has one other military project beyond the huge airbase program:

This is a $64.2-million Naval air facility at Port Lyautey. Construction is being handled as a joint venture of J. Rich Steers Inc., and Grove, Shepherd, Wilson and Kruge, New York. Architect-engineer is Mackenzie, Bogert & White, also of New York.

• **Egypt** reports only one job at the moment for Americans—but it has asked financial and technical help in planning further utilization of the Nile River.

Arthur D. Little, Inc., of Cambridge, Mass., holds a TCA-sponsored contract to survey low-cost housing materials and construction, and to test and demonstrate construction machinery.

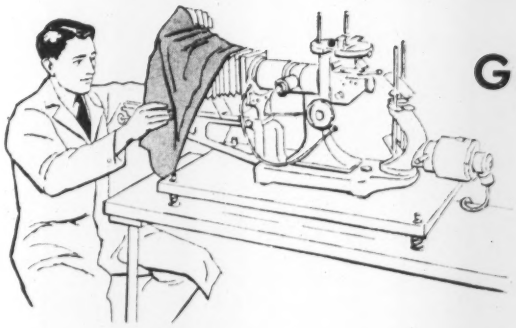
(*Continued on page 85*)


UNIFORM WALL THICKNESS. NO WEAK SPOTS.
CLEAN INSIDE SURFACE FOR SMOOTH FLOW.
PRECISION THREADS FOR EASY RUNNING-UP AND TIGHT JOINTS.
DIMENSIONAL ACCURACY.
SUPERIOR METAL, FREE FROM SAND HOLES AND WALL LEAKS.
PROPER CHAMFER FOR EASY STARTING.
90°
SUBSTANTIAL FLAT BAND FOR SURE PIPE WRENCH GRIP.

Rigid Inspection

From foundry to finished fitting—modern inspection methods insure the quality of

GRINNELL PIPE FITTINGS



The "Photomicrograph"
By means of photomicrographs, the metal structure of castings is thoroughly checked for full information on production quality.

For instance, for malleable fittings, laboratory technicians make an hourly chemical analysis of foundry metal to insure uniform, high quality. Daily tests by photomicrograph reveal metallurgical structures. Sample bars from each melt are subjected to tensile strength tests . . .

Fittings must pass a 100% inspection both before and after machining. Quality control includes alignment tests, high pressure hydrostatic tests, and comparator checks on the accuracy of threads and chamfer.

That's why, when you specify Grinnell cast iron and malleable iron pipe fittings, you are sure of —

- High quality metal
- Dimensional accuracy
- Clean inside surface for smooth flow
- Proper chamfer for easy starting
- Precision threads for easy running-up and tight joints

To make fittings the safest, strongest link in your piping system . . . choose from the wide Grinnell line. Available from your local Grinnell Distributor or a Grinnell Warehouse.

GRINNELL
WHENEVER PIPING IS INVOLVED

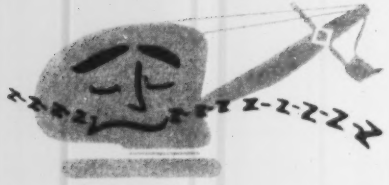
Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

Manufacturer of: pipe fittings • welding fittings • forged steel flanges • steel nipples • engineered pipe hangers and supports Thermolier unit heaters • Grinnell-Saunders diaphragm valves • prefabricated piping • Grinnell automatic fire protection systems

There are TWO WAYS

THE EASY WAY . . . .

. . . is to design a few basic machines, and then build up a line of additional models by adding extra counterweight and by speeding up the engine to try to meet two or three size requirements. The only real difference in these models lies in the counterweight and the dipper capacity.

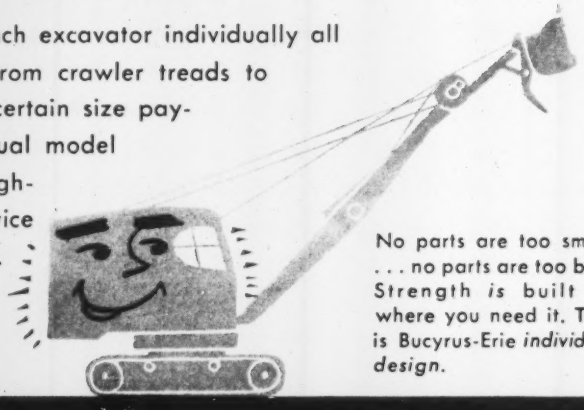


Of course, some of these machines will carry dippers too small. They won't produce the output they should — power is wasted.

Other machines with dippers too large and counterweight too heavy will sweat and strain from overloads and overwork. They will run up high repair bills and wear out in a hurry. Strength is not built in where you need it.

THE BUCYRUS-ERIE WAY . . . .

. . . is to design each excavator individually all the way through from crawler treads to boom point for a certain size pay-load. Each individual model is engineered throughout to meet the service and loads required.



No parts are too small . . . no parts are too big. Strength *is* built in where you need it. This is Bucyrus-Erie *individual design.*

8E53C

BUCYRUS ERIE

to build a line of

SHOVELS • DRAGSHOVELS • DRAGLINES • CLAMSHELLS • CRANES

Contractors with big work — overseas — where many unfamiliar conditions pose problems of profit or loss — depend upon the familiar and friendly BUTLER PLANT for steady and stable concrete production.

As proof of that confidence, American contractors are operating BUTLER PLANTS from the Arctic to the Latin American Tropics and from Europe to the Orient . . .

Where distance from home puts an unholy cost on replacement parts because of down-time — it is significant that BUTLER PLANTS are the choice.

So, from construction abroad to construction at home; from dams to housing projects; from short highway jobs to turnpikes — there's a BUTLER PLANT to put a better profit in your contract.

TWO FREE BULLETINS — Your choice of one or both! For a complete showing of Ready Mix Plants, ask for Bulletin 185. For detailed description of BUTLER Roadbuilders' Plants, request Bulletin 205.

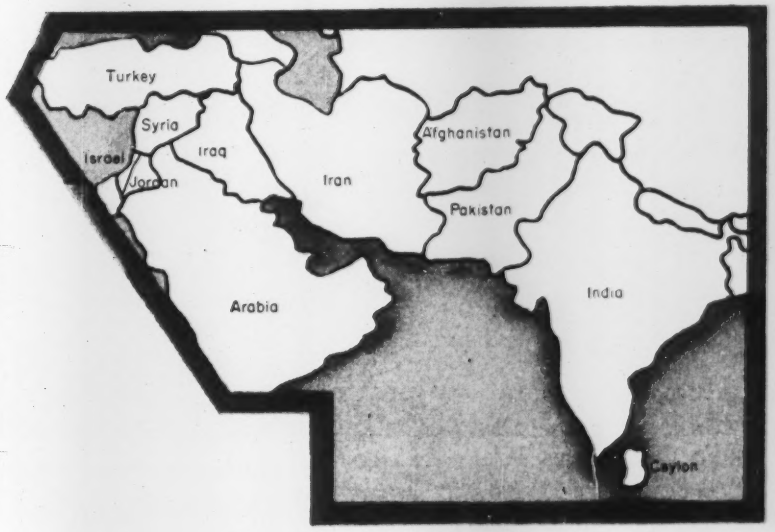
BUTLER BIN COMPANY

947 Blackstone Ave. Waukesha, Wisconsin

THE MIDDLE EAST:

Opportunity aplenty

Standard Oil Co (N. J.) photo



One of the world's bright spots—from the view of the American construction man—is the Middle East. In every one of the ten countries assigned in the accompanying map to this geographical division, Americans can be found at work either planning projects or actually supervising their construction.

From Turkey around the half-moon of nations that ring the eastern end of the Mediterranean—and further east to Afghanistan and India — there's work to be done. Ancient civilizations yearn for more modern ways of life, governments—some of them rich with the profits from oil—invest in better facilities for their peoples, and perpetuation for themselves.

Generally, conditions are favorable for Americans. The reservoir of know-how within the countries themselves is almost non-existent, and competition with engineers of European countries—while keen—is on a free and equitable basis.

• **There's plenty of labor,** very little in the way of materials, very little in the way of skills with machinery—but some amazing skills in the handwork that still goes into much construction in this area. There's a great deal of superstition to be overcome—and in many places the first job an American faces is simple sanitation, before he can go ahead with anything else.

But the peoples of these under-developed countries are awakening to their capacities—they've found they can operate machines and make a better living. They're learning that better health and a more satisfactory existence is not beyond their grasp. And they are beginning to sense that the development of their natural resources will help provide the buying power they need.

All this is best exemplified in Arabia where oil development has fostered the growth of community as contrasted to nomadic living—and with it a need for better food production—hence demands for better roads, more power, better ports, schools, hospitals.

Obstacles have been the almost complete lack of any idea of sanitation, sometimes miserable climates, a native distrust (somewhat dispelled during World War II) of foreigners—and the wildly unstable governments of some of the countries involved.

Nevertheless the Middle East is a fertile field for the American method and the American machine—the quantities to be moved are big enough to warrant big machines; the jobs to be done warrant big organization. (That

WAGE RATES PER HOUR IN NATIONAL CURRENCY

City	Exch. rate June '53 per $1 US	Common Labor Hvy. Constr. 6/53	Common Labor Hvy. Constr. 6/52	Building 6/53	Building 6/52	Bricklayers 6/53	Bricklayers 6/52	Carpenters 6/53	Carpenters 6/52	Structural ironworkers 6/53	Structural ironworkers 6/52
Istanbul, Turkey[c]	2.825 liras	0.70[A]	———	0.60[B]	———	0.90	———	1.20[C]	———	1.20	———
Tel-Aviv, Israel[b]	1 £1	[a]	[a]	5.850	4.650	6.750	5.550	6.750	5.550	[a]	[a]

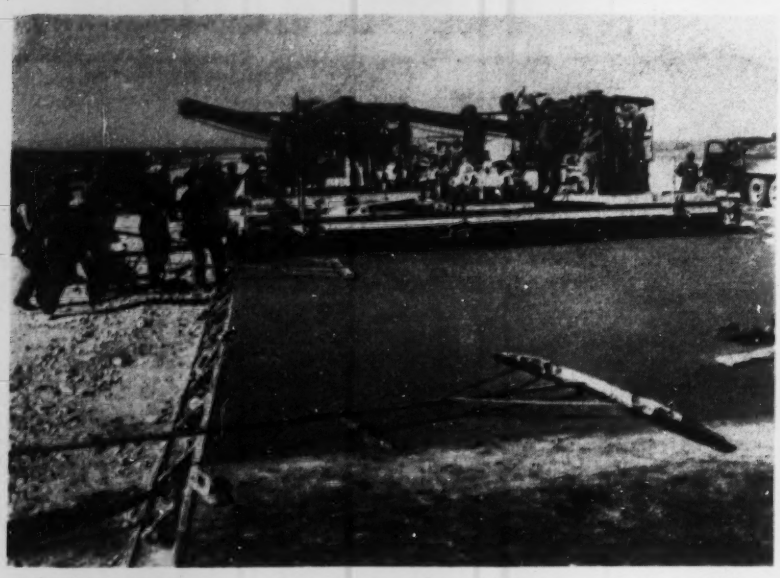
• a no such category • b rates (approx.) per 8 hr. day for organized labor • c 10-hr day

Ranges • A 0.50-0.70 • B 0.45-0.60 • C 1.00-1.20

MATERIALS PRICES IN NATIONAL CURRENCY F.O.B. CITY, JUNE '52 AND JUNE '53

City	Structural Steel per ton 6/53	Structural Steel per ton 6/52	Reinf. Steel per ton 6/53	Reinf. Steel per ton 6/52	Portland Cement per ton 6/53	Portland Cement per ton 6/52	Lumber 2x4 S4S per M ft bm 1st class pine 6/53	Lumber 2x4 S4S per M ft bm 1st class pine 6/52	Lumber 2x4 S4S per M ft bm 2nd cl. pine 6/53	Lumber 2x4 S4S per M ft bm 2nd cl. pine 6/52	Lumber 2x4 S4S per M ft bm local equiv. 6/53	Lumber 2x4 S4S per M ft bm local equiv. 6/52
Istanbul, Turkey	650[a]	———	580[a]	———	60[ad]	———	240[be]	———	200[be]	———	———	———
Tel-Aviv, Israel	275[a]	275[a]	225[a]	225[a]	41.250[a]	18.500[a]	135[b]	135[b]	125[b]	125[b]	78[bc]	78[bc]

• a per metric ton • b per cu meter • c European spruce • d fob plant • e at yard



TURKISH LABOR takes readily to the uses of big U. S. concrete paving machines, working here as American contractors push ahead on airfields and airfield facilities supervised by the Mediterranean Division of the U. S. Corps of Engineers.

IRAQUI CAMELS don't worry much about lack of roads—but for wheeled transport, it's rough going.

doesn't yet quite go in India, though. Labor is so plentiful—and so little-paid—that despite the apparent confusion it is often considered better to use thousands of people than a few machines.)

Here's the situation:

▶Turkey

First of the Middle Eastern countries—and probably strongest politically and economically — is Turkey, with a good record of a democratic government and of friendship for the United States.

Ever since Kemal Ataturk overthrew the Ottoman rule and proclaimed himself president of the country, Turkey has striven mightily to modernize itself and hold its place among the nations. Blessed with a comparatively large (296,503 sq. mi.) area, and a varying climate and topography, it alone of the Middle Eastern nations had a good prospect of being able to feed itself adequately, and produce and manufacture most of its own needs.

Almost immediately after World War II, the Turkish Etibank—a government agency—employed a U. S. firm (Parsons, Brinckerhoff, Hall & Macdonald of New York) to plan for a new port at the coal town of Zongaldak, on the Black Sea; and later a World Bank mission made a complete survey of port and other facilities to serve as a guide to further development. The port is now being built, and one element of the general development plan—Seyhan Dam, near Adana on the Mediterranean Coast —has just been let to contract to an American firm, Morrison-Knudsen Inc., Boise.

Construction materials manufactured or produced locally (bricks, lime, roof tiles, stone, sand, gravel, terazzo, cement, sewer pipes, etc.) are plentiful. But portland cement, and almost all types of steel produced meet only about 50% of demand. Due to difficulties with foreign exchange (although the currency is stable) even imports don't fill the needs.

Labor rates are generally higher than in most countries of the Middle East, and the quality of the labor is good.

Some of the work under way in the country now includes:

• Morrison-Knudsen Inc.—contract at $14.5 million for construction of Seyhan Dam, part of an estimated $67-million program for developing the Adana Plain, near the Mediterranean seacoast. With Knappen, Tippetts, Abbett, McCarthy of New York as consultants, the project will include hydro power, irrigation, flood control.

• KTAM has completed surveys of two other potential hydro and flood control sites—the Gediz River Valley and the Buyuk Menderas River Valley. The same firm has also reported to the Turkish government with a complete engineering and economic survey and development plans for the nation's transport system.

• Thompson-Starrett Co., New York, in harness with Turkish private capital and labor, is building a $15-million resort city at Cesme, on the Aegean Sea, 80 miles from Ismir (Smyrna). The resort will include 1,500 homes, a hotel, casino, various sports areas, a complete net of roads and community services.

• Ralph Parsons So., of Los Angeles, is the contractor on erection of a petroleum refining plant at Raman—a government project.

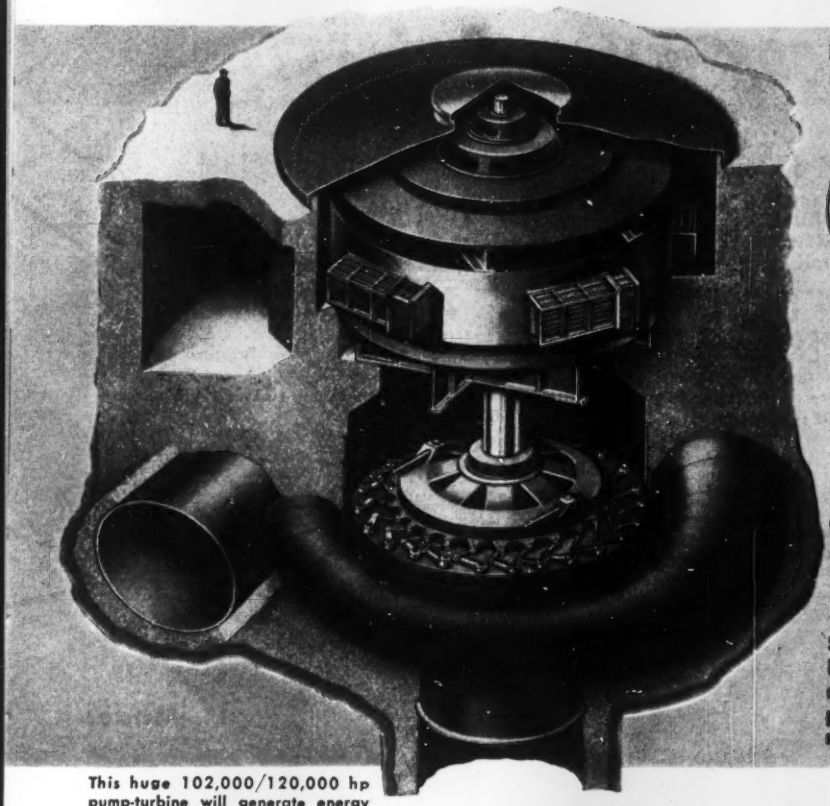
• Metcalfe Construction Co., and Gordon Hamilton Contrg. Co.—are contractors for $46 million worth of military airports at seven sites: Adana, Balikesir, Bandirma, Batman, Diyardakir, Eskischir and Merzifon—under U. S. Army Engineers supervision.

• Southwestern Engineering Co., of Los Angeles, is the contractor on government-owned mineral flotation plants at Ergani and Easter Chrome. Two contracts for similar work are held by Western Knapp Co., of San Francisco and McNally Pittsburgh Co., of Pittsburgh, Kan. at Ergani and Soma. The plants are to be used in the preparation of lignite for thermal power stations.

• Hamilton Overseas Construction Co.—contract for coal mine tunneling at the Zonguldak coal fields; also at Zonguldak, The Koppers Company of Pittsburgh, Frederick Snare of New York and Paul Weir, of Pittsburgh

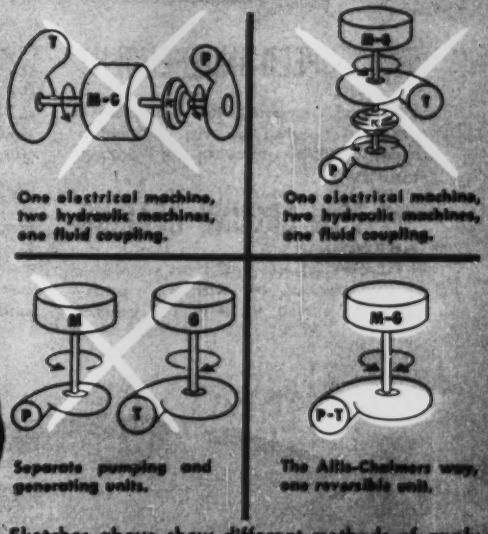
(*Continued on page 91*)

ALLIS-CHALMERS Pioneers *REVERSIBLE* Pump-Turbines!



This huge 102,000/120,000 hp pump-turbine will generate energy during peak demand periods, then reverse and — using surplus power from other plants — restore water to the reservoir during off-peak periods. Power value differential will make operation economical.

HOW REVERSIBLE PUMP-TURBINE REDUCES EQUIPMENT NEED



One electrical machine, two hydraulic machines, one fluid coupling.

One electrical machine, two hydraulic machines, one fluid coupling.

Separate pumping and generating units.

The Allis-Chalmers way, one reversible unit.

Sketches above show different methods of applying motive and generating equipment for pumped storage. Note that the Allis-Chalmers reversible pump-turbine at lower right requires least equipment and simplest power plant construction.

NOW BUILDING 5 UNITS FOR PUMPED STORAGE

THIS RECORD SIZE pump-turbine is now under construction by Allis-Chalmers for the Hiwassee dam in North Carolina. It combines in one reversible, two-element unit an electrical machine rated 102,000 hp as the world's largest motor and a hydraulic machine with the world's largest Francis runner.

When operating at maximum head as a turbine, this reversible unit will develop 120,000 hp. As a pump, it will move a maximum of 5200 cfs, 3.3 billion gallons per day . . . three times the capacity of the largest existing pump.

Allis-Chalmers — builder of over 12 millions of installed hydraulic horsepower — pioneered the development of the reversible pump-turbine for pumped storage. A-C offers you undivided responsibility, being able to design and build *all* elements of an entire reversible pump-turbine unit.

Of the five reversible pump-turbines A-C is now building, the Hiwassee unit is the largest. First scheduled for service is the 12,650 hp unit for the Flatiron Power & Pumping plant in Colorado. Three 19,000 hp units for the Sao Paulo Light & Power Co., Ltd., Brazil are now being built at Canadian Allis-Chalmers, Ltd., Montreal.

You get the real design advances *first* from Allis-Chalmers. And dealing with A-C is convenient, too, with 95 sales offices and 65 distributors located in 53 countries. For your free copies of Reversible Pump-Turbine Bulletin 01R7784 and illustrated, 56-page Bulletin 02B7301 of world famous hydro plants, just call your nearest A-C distributor or write to Allis-Chalmers, Milwaukee 1, Wisconsin, U.S.A. A-4011

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

Builders of the World's Widest Range of Public Works Equipment

WE'RE SO PROUD TODAY...WE'VE GOT

A NEW BANT

...JUST LOOK WHAT YOU GET!

✓ 2-SPEED INDEPENDENT TRAVEL—enables the operator to move at varying speeds, forward or reverse, while operating the front end attachment.

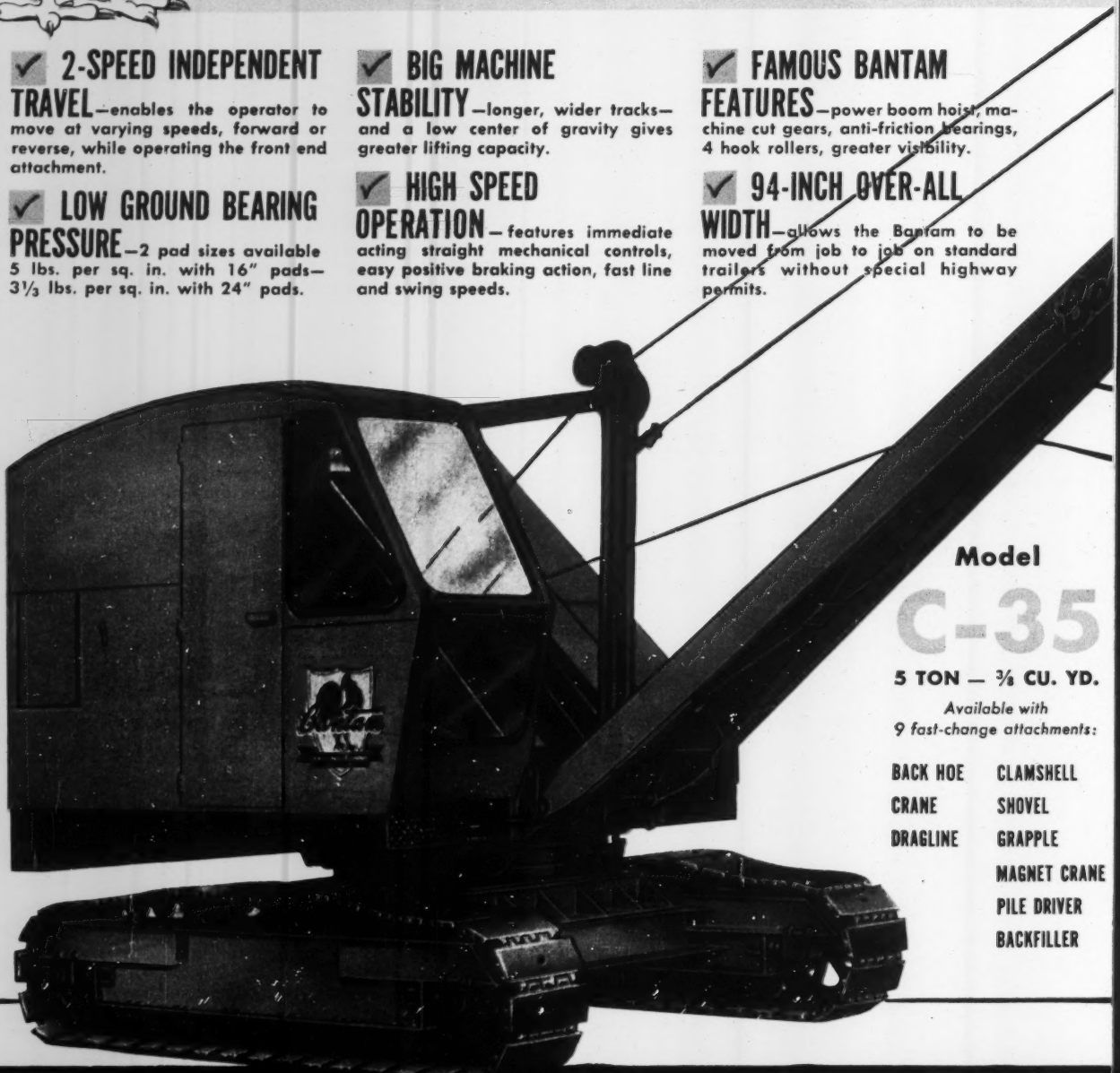
✓ LOW GROUND BEARING PRESSURE—2 pad sizes available 5 lbs. per sq. in. with 16" pads—3⅓ lbs. per sq. in. with 24" pads.

✓ BIG MACHINE STABILITY—longer, wider tracks—and a low center of gravity gives greater lifting capacity.

✓ HIGH SPEED OPERATION—features immediate acting straight mechanical controls, easy positive braking action, fast line and swing speeds.

✓ FAMOUS BANTAM FEATURES—power boom hoist, machine cut gears, anti-friction bearings, 4 hook rollers, greater visibility.

✓ 94-INCH OVER-ALL WIDTH—allows the Bantam to be moved from job to job on standard trailers without special highway permits.



Model

C-35

5 TON — ⅜ CU. YD.

Available with 9 fast-change attachments:

BACK HOE
CRANE
DRAGLINE
CLAMSHELL
SHOVEL
GRAPPLE
MAGNET CRANE
PILE DRIVER
BACKFILLER

ANOTHER NEW PRODUCT OF THE SCHIELD Bantam Co.

WORLD'S LARGEST PRODUCERS OF TRUCK-CRANES AND EXCAVATORS

AM!® IT'S A CRAWLER

and it sells for only $9,350

F.O.B. FACTORY—BASIC CRAWLER WITH 1400 LB. COUNTERWEIGHT, LESS ATTACHMENT
Price Subject to Change

Your SCHIELD Bantam Distributor is Scheduling On-The-Job Demonstrations

Right Now... *See Him Today!*

(or write factory to set a date)

● Over 4,500 Satisfied Bantam customers all over the world tell the story better than we can! Building one size machine and making it a top quality rig has been Schield Bantam's contribution to Shovel-Crane Industry. Bantam's specialization and mass production of this ⅜ cu. yd. machine has meant higher quality at the lowest cost in the industry! The idea of the all-purpose ⅜ cu. yd. power shovel-crane has long since found wide acceptance. NOW . . . you, too, can receive the rewards from this great American idea by letting Schield Bantam solve your lifting and excavating problems! **Whether your work calls for a crawler or a truck mounted crane-excavator, the BANTAM can do your job faster...better...cheaper! Write *today* for further information on the BANTAM for *your* jobs!**

Schield Bantam Co. 201 Park St., Waverly, Iowa

THIS, TOO, IS ALL NEW!

Model T-35

6 TON ⅜ CU. YD.

A BRAND NEW CRANE CARRIER CUSTOM BUILT BY A FAMOUS TRUCK MANUFACTURER

BACK HOE

Crawler working in solid mud . . . crawls out after trenching with no trouble. High flotation enables Bantam to work in any kind of underfoot conditions—muck, mud, sand, etc.

SHOVEL

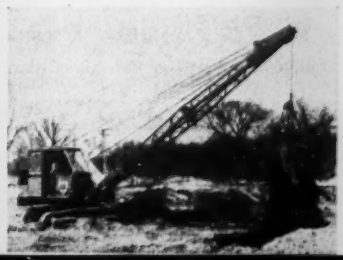
Handles up to 100 cu. yds. per hou. from stock-pile . . . up to 90 cu. yds. excavating in average material. Automatic dipper trip means quick, effortless dumping. Also available with ½ cu. yd. rehandling bucket.

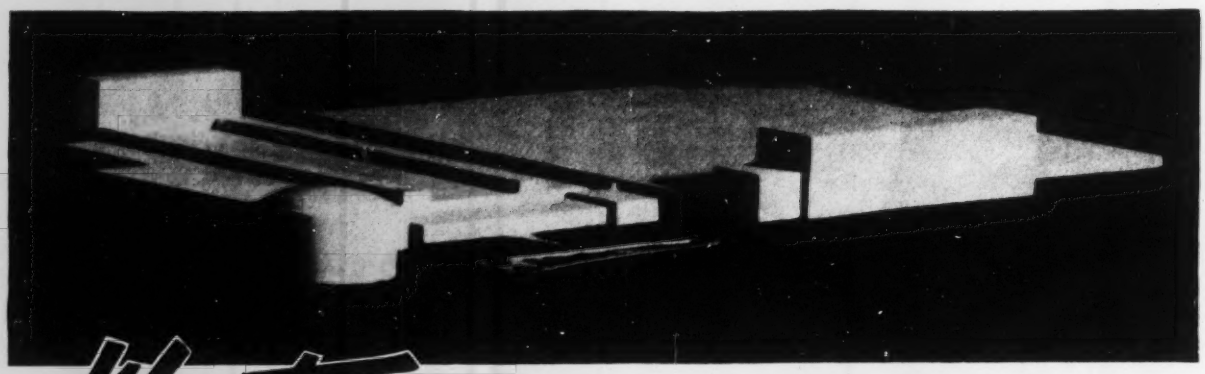
DRAGLINE

Digs 90 cu. yds. per hour in average material, available with perforated or solid buckets. Ideal for gravel pits, ditch cleanout, cutting new drainage ditches, basement excavations, stock-piling, pits, etc.

CLAMSHELL

Ideal for stock-piling and loading out of stock-pile . . . precision excavating of bell holes, special excavating on pipeline jobs, cleanout of trenches. Handles up to 80 cu. yds. of average bulk material per hour.





Western OVERCOMES BAFFLING FOUNDATION CONDITIONS FOR DETROIT'S NEW WATER SUPPLY STRUCTURES

PROJECT: Foundations for the high lift plant, switch house, weir chamber, filter building, and wash water building for the Department of Water Supply of the City of Detroit.

SPECIFICATIONS: Specifications required the pile to take 200% of working load with maximum GROSS settlement of ¾ in. Sweep specifications required that a part of the bottom of the pile be seen from the top when a light was lowered into the pile. No concrete could be poured in any pile until it was established that pile was outside the "radius of heave." As many as 2000 pile casings were unfilled at one time. It was further required that the pile be end-bearing.

All piles had to be driven 90 to 120 ft. to hardpan through a heaving, shifting, hard clay upper crust overlying a restless stratum of soft clay mixed with gravel and boulders.

DIFFICULTIES: 1. Piles installed in the experimental stage moved laterally in various directions for distances measured in inches during a three week period when no work was being done. 2. Many of the test piles subsided after a long upward movement. 3. Entire volume of soil displaced by piles should have caused a maximum ground heave of 2.7 ft. Yet the maximum ground heave actually exceeded 4 ft.! 4. When bored 20 ft. or more through the hard upper stratum ahead of driving operations, core holes moved as much as thirteen inches without any distortion of the holes themselves. 5. The projectile pipe section developed fairly sharp bends when obstacles were encountered so that the pile could not meet the plumb and sweep specifications.

RESULTS: WESTERN installed 4,824 composite projectile piles with a total length of over half-million feet. Pile load capacity was checked by seven 100-ton load tests. Maximum GROSS settlement in any pile was ½ in. By lowering a metal cone gage of ½ in. less diameter than inside diameter of shell, it was found that there was no distortion in any of the piles. Job was completed within specified 24 week period.

Write for literature entitled, "The Mystery of the Restless Substratum," giving full details of the project.

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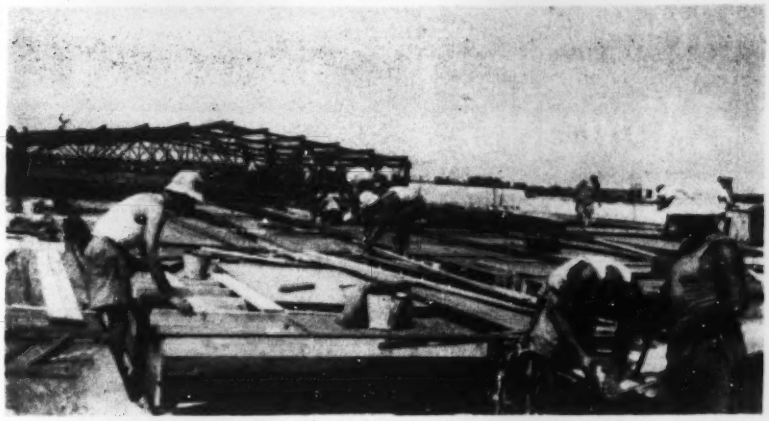


ROOF GOING INTO PLACE here will cover Israel's new paper mill—first in the nation. Mill is part of a "bootstrap" operation to make Israel self-sufficient.

are consultants to the government-controlled Eregli Coal Mining Administration.

• Charles T. Main, of Boston, is consultant to the government on its Sariyar Dam and hydro plant; and Stone & Webster Corp., Boston, is consultant on power transmission lines being built between Catalgazi and Istanbul.

• Thompson-Starrett also holds a contract for construction of the $47 million Sariyar Dam.

• The U. S. Bureau of Public Roads has provided technical assistance to the Turkish government for a continuing expansion of its highway and transport system.

▶ Iraq

One of the smallest (168,000 sq. mi) of the Middle Eastern nations, Iraq has been one of the leaders in the move to pull itself out of a medieval way of life. Proud of paying its own way (for the most part) the kingdom has (since World War II) looked consistently to the U. S. for technical aid.

Biggest work in hand is the beginning of a half-billion dollar attempt to reclaim the valley of the Tigris and Euphrates Rivers—the biblical Garden of Eden—and make its now alkali-encrusted lands again productive enough to feed the roughly 5,000,000 persons that make up the nation. But highway construction programs, economic studies, sanitation programs, manufacturing plants are also part of the general picture.

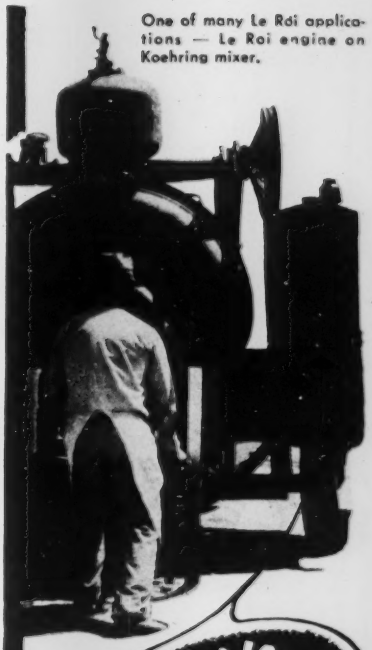
Money comes largely from oil royalties, and the local currency—the dinar—is stable. Construction materials (except sand, stone and gravel) are virtually non-existent, and the available native technical staff is tiny.

One peculiar problem for builders: Ordinary wood stakes used to mark survey points cannot be used—natives gather them up as heaven-sent in an area where firewood is scarce; other types of markers (except stone) are often appropriated for other uses. Farmers—thinking surveyors are figuring out new divisions of lands—either welcome or violently oppose their appearance.

Starting with the biggest work—though it is yet in the planning stage, here's some of what's going on in Iraq:

• Knappen, Tippetts, Abbett, McCarthy is now making comprehensive surveys of the Tigris-Euphrates Valley, preparatory to launching the huge $555 million program that the Iraqi government figures will take 20 years to complete. Involved will be low dams across the rivers for diversion, provision for complete drainage of the alkali-encrusted lands, a canal system, pumping stations and the like. The problem is complicated by the flat nature of the terrain (only 30-ft. differential for a vast web of irrigation canals). Interestingly enough, much of the original irrigation work put down in the time of Alexander The Great is in exactly the locations to be followed by the new work.

• Harza Engineering Co. of Chicago is also at work on a part of the overall scheme: Preparing designs for Bekhme Dam on the Greater Zab River (a Tigris tributary). Plans call for a 560-ft high massive buttress concrete dam, located 275 miles north of Baghdad. It will impound 5.5 acre-ft of water, providing irrigation, a 2 billion kwh hydro plant, and offer flood protection to the lower valley. Cost is estimated at about $27 million.



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Middle East

HELP FOR FARMERS of Lebanon is planned from surveys of irrigation project.

Edwards, Kelly and Beck, Newark, N. J. consulting engineer firm is advisor to the government on development of a highway system.

Other programs planned include construction of five crude oil stabilization units at Kirkuk, to handle 250,000 bbl daily; and a huge program for the "Miri Sirf"—state-owned lands—which contemplates relocation of many farm families, and attendant construction work for utilities, irrigation water supply and other facilities.

▸ Iran

Long regarded as an area of great promise for construction, Iran's dizzying political gyrations of the past few years have made the country a large question-mark on the Middle Eastern map.

A proposal is before Congress to appropriate $11-million for design and supervision of dams and hydro plants in Iran. Three dams currently under construction are under the partial supervision of Bureau of Reclamation engineers, and a few other TCA teams are making surveys of the industrial and natural resources potential. But, until present political troubles are resolved, the potential for U. S. builders will remain just that.

▸ Israel

One of the world's newest—and most eager—nations, five-year-old Israel is fighting hard to pull itself up by its bootstraps, and to make room for an ever-increasing population.

It is beset, however, with financial troubles: There isn't enough industry or anything else, yet, in the country to provide foreign exchange in quantity. Result is that most funds come from bond issues and fund drives, largely circulated in the United States. A further result is the need for close

BIG WAREHOUSES for airbase at Dharan in Saudi Arabia combine intricate native skills at stone-masonry with American design and construction methods.

trading, and much "make do" by local forces with local materials and equipment.

As in most of the neighboring countries, Israel's needs and desires far outrun the technical and physical capacity of its people, so foreign contractors (including Dutch and British, as well as American) have succeeded in obtaining construction work in the country.

Specific U. S. jobs include:

• Construction Aggregates Co., of Chicago, has two contracts. First is an agreement with the Jewish National Fund for reclaiming some 25,000 acres of swampland near Lake Huleh—a project involving drainage, deepening the channel of the Jordan River, and providing protection from occasional spring floods. The second job is to survey a road to connect Beer-Sheva (in the Negev desert) with the Red Sea port of Elath.

• Chemical Construction Corp., of New York, is now at work building a group of sulphuric acid and ammonia plants for Fertilizers and Chemicals Co., Ltd., a private concern in Haifa. The project includes design, erection and supervision for a $4.5-million installation.

• Lock Joint Pipe Co., East Orange, N. J., is working with the Mekoroth Water Co. (in charge of Israeli water supply) on production of an estimated 300 miles of concrete pipe in diameters ranging from 30 inches up to 66 inches, to form part of a major irrigation scheme that will bring water into the arid central valley of the country.

There are many other plans: Construction of a deep-sea port south of Tel-Aviv, a railroad to connect this new port with inland points; other highway programs, also more work in housing.

▸ Lebanon, Jordan

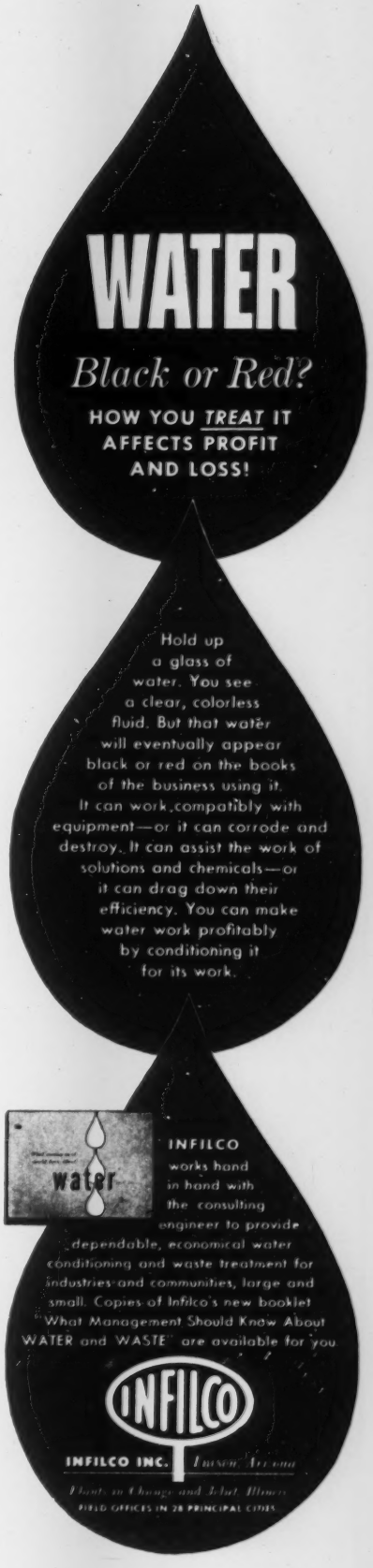
There are no "no Americans wanted" signs up in these countries—and U. S. aid in both money and technical assistance has been asked and received. But at present, there are no American contractors at work here.

There are plans, though: for Lebanon, the Qassmia River project to cost $2.5 million for irrigation, and the $70-million Litany River hydroelectric plan, for both of which U. S. technical aid has been sought. Twenty-two Bureau of Reclamation technicians are at work on the Litany River project which will include 180-ft high Karoun Dam and four other structures, 211 miles of pressure tunnel, 6 power plants.

In Jordan, a $100-million plan is being worked out for damming the Yarmuk River to supply electric power and irrigation water. Michael Baker, Jr., Inc., Rochester, Pa., and Harza Engineering Co., Chicago, hold a contract for studies and design of the project.

▸ Afghanistan

Moving away from the countries around the eastern end of the Mediterranean, Afghanistan has awarded a contract to Morrison-Knudsen for construction of two dams and a canal for an irrigation and power scheme. The total cost of the project—result of several exhaustive surveys of the nation's potential (by Morrison-Knudsen and others)—is set at an initial $22 million. The project includes two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Standard Oil Co. (N.J.) photo

STARTLING as the oil refinery on Arabia's barren sands are these typically American residences, being built for oil company employees and their families.

sizeable earth and rockfill dams and an extensive irrigation system.

▸ Pakistan

Another brand-new country in the Middle-East, outgrowth of the independence of Britain's former Indian possessions, Pakistan is only at the start of a number of major programs for its self-improvement.

It has obtained a "Point Four" (TCA) loan of more than $12 million to finance preliminary engineering investigations of a number of major projects, including:

A fertilizer factory to be built at Mari Indus in the Punjab; construction of a dam on the Bolan River in Baluchistan for irrigation; construction of a modern harbor at Karachi; a program known as the Village Aid Plan—to raise standards of living through health and sanitation measures; and for a soil mechanics and hydraulics laboratory, to be set up at Karachi.

One commercial contract is under way with an American firm—The Kuljian Corp. of Philadelphia—for construction of a newsprint plant.

One other American group—Harland Batholomew & Associates of St. Louis—holds a contract to provide technical advice on municipal water supply and sewerage systems.

▸ Arabia

Like most of the Arab countries, Saudi Arabia owes its present prosperous state to the vast oil reserves found under its barren sands. And most of its progress stems from the engineers of the oil companies, as well as to an enlightened government.

By an arrangement, since copied by other nations in the area, oil companies working in Saudi Arabia are required—in addition to payment of royalties to the government—to supply technicians to work with the government to advise it (and design and supervise, if necessary) on matters of sanitation, transport, public health and education. Indeed, such arrangements are not unpalatable—since the oil companies found they had to institute such programs themselves to maintain proper working conditions and production.

Materials of construction are scarce—even sand for concrete has to be imported, since the illimitable local sands are too fine and smooth. Labor also is scarce, because of the high employment of healthy citizens (not a plentiful commodity) by the oil companies themselves.

Nevertheless, these jobs are under way:

- Bechtel International Corp., San Francisco holding a $4-million contract for improvements to electrical systems, improving harbors, roads and an airport.
- Michael Baker, Jr., of Rochester, Pa., is the engineer on a $10-million public works construction program.
- The Fluor Corp., of Los Angeles, contractor on a major U. S. airbase at Dharan.

▸ India

A good many Americans are at work in India, despite stiff competition from other foreign builders (and

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locally). But there are not nearly as many as some observers think there should be.

Reasons add up this way:

(1) U. S. bids are almost invariably higher than those of other nationals.

(2) The U. S. is new in the field here, whereas the Dutch, the British, even the Japanese, have the advantage of long contacts.

(3) The Government of India continues to insist that foreign firms undertaking construction jobs use Indian engineers and contractors wherever possible—even when a project is partially financed by foreign capital.

This situation seems to be easing a little—particularly with the recent passage of the Five Year Plan, which specifies that foreign capital is especially welcome (India discovered a gap of more than $1.2 billion in funds available to carry out its huge construction program) in fields where Indian technical know-how is lacking.

This law, plus an obvious easing of the government's strongly nationalistic policies, leads many observers to think that American firms may be favorably affected. Americans seem to stand the best chance of obtaining contracts where their technical qualifications (on oil refinery work, large dams, tube wells) outweigh the additional expenditure and the shortage of dollars.

Biggest barrier, of course, is money. Large-scale construction in India depends largely on international loans.

Despite all this, the opportunities are enormous. Thousands of miles of roads and railways must be built or rehabilitated, the tremendous power potential of the country's great rivers has hardly been tapped, the ports and harbors need expansion, irrigation, sanitation and elementary municipal services are almost unknown in many areas.

Among U. S. participants in India:

• Ebasco Services Inc., New York—Working on two jobs—a new paper mill (India's first) at Nepanang; and the 125,000-kw Trombay Thermal Electric Station, for the Tata Power Co., Ltd.

• Harold T. Smith, Inc., Washington, D. C.—Working on $4.4-million contract to install tube wells for local irrigation in north India, east and west of Delhi.

• The Kuljian Corp. of Philadelphia—In charge of design and construction, and International General Electric Co. is supplying and erecting equipment for the 240,000-kw, $71-million Bokaro thermal electric station scheme, southeast of Patna, capital of the State of Bihar. This is a unit in the huge Damodar Valley development which includes eight dams for hydro power and irrigation.

• Lummus Company, New York—A $35-million oil refinery at Trombay, near Bombay, for the Standard Vacuum Refining Co. of India, Ltd., designed by Stanvac, New York. Lummus is also building an almost exactly similar refinery for Burmah Shell, also in Bombay.

• Merritt-Chapman & Scott Corp.—Awarded a contract for construction of a $4-million system of subaqueous and overland pipelines to link the two refineries at Bombay with an offshore marine terminal. More than 50 miles of pipe will be put down.

• Adams, Howard & Greeley, of Boston—Preparing town plans for the Indian government.

• Mayer & Whittlesey, New York is planning a new city for India in Punjab Province.

• Koppers Co. Inc., Pittsburgh—Acting as a member of a technical committee surveying the possibilities of an $18-million steel plant.

• American Cyanamid, Inc.—Has subscribed 10% of capital and will supervise design and construction of a $12-million fertilizer plant at Bulsar, 150 miles north of Bombay, for an Indian firm (Atul Products, Ltd.).

• Harza Engineering Co., Chicago—Has prepared the designs and is supervising construction on Maithon Dam of the Damodar Valley scheme. An earthfill, it will provide the largest storage in the system and incorporate a 40,000-kw power plant.

And many Americans—either as individuals or as representatives of consulting firms or government agencies—are at work on such huge projects as the Damodar Valley scheme (where L. F. Harza, Chicago and S. O. Harper, San Francisco, are members of the three-man consulting board); Bhakra Dam on the Sutlej River, a rival in size to Boulder Dam (M. H. Slocum is project manager); and many others.

Tucked away in the Indian Ocean off India, Ceylon has finally started its long-planned project to bring water to arid sections. A $12-million job is under contract to Morrison-Knudsen, for a multi-purpose dam and irrigation works.

▶ Bahrein Island

Parsons, Brinckerhoff, Hall & Macdonald, New York has been engaged by the Bahrein Petroleum Co. Ltd., to aid in the design and supervision of construction of a thirty mile highway on this Persian Gulf island.

(*Continued on page 99*)

HOW TO HANDLE
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• For 10 years this foreign contractor, like others, has relied on Griffin. The 2-stage wellpoint system used in this instance was designed to stabilize the soil and provide insurance against subsidence of existing structures. For "quick-dry" . . . specify . . . Griffin.

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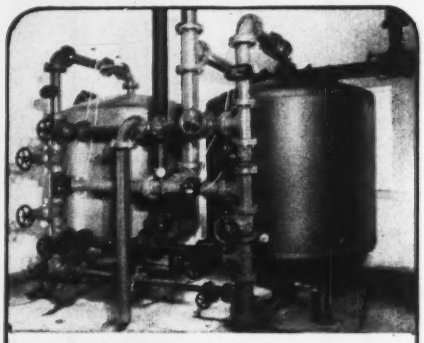

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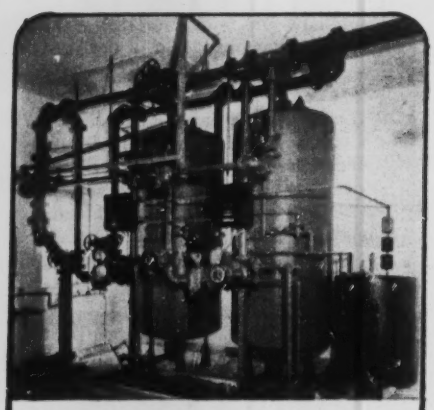

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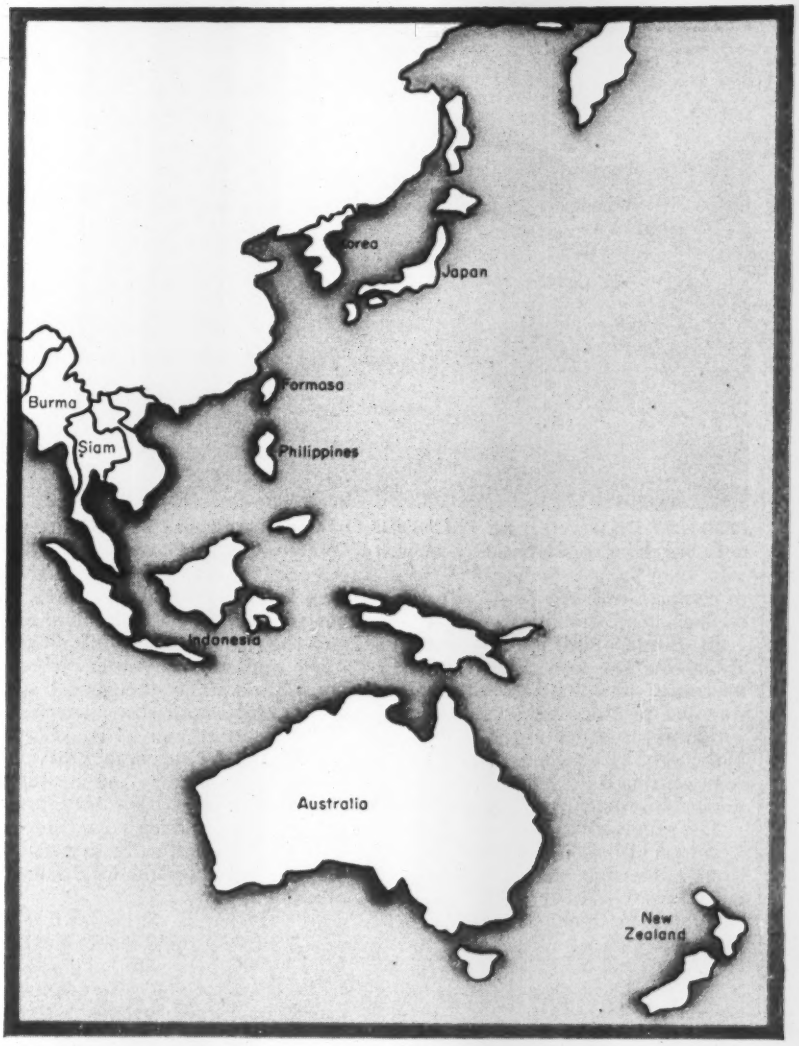

Opportunity—present but spotty in

THE FAR EAST

Depending on where you look, attitudes in the Far East range from "why don't you come over?" to "not much room here," to "no Americans need apply."

Australia, for instance, likes U.S. contractors, thinks they are the ones with the know-how and equipment for the large projects in its vast hinterlands, is somewhat hurt that more U.S. firms don't come to Australia looking for work. Australians admit that the radical labor legislation and restrictions against outsiders of a few years ago did a lot to create this attitude. But they are quick to point out that those conditions don't exist now—and there's lots of work to be done.

In the Philippines, on the other hand, Americans theoretically enjoy the same rights and privileges that Filipinos do—but the fact is that restrictive "flag laws" (similar to the "Buy American" laws recently under discussion in the U.S.) make it extremely difficult for U.S. contractors and engineers to operate.

And in Japan, while they don't say "no" to Americans it's tough work

WAGE RATES PER HOUR IN NATIONAL CURRENCY

City	Exch. rate June '53 per $1 US	Common Labor Hvy. constr. 6/53	Common Labor Hvy. constr. 6/52	Building 6/53	Building 6/52	Bricklayers 6/53	Bricklayers 6/52	Carpenters 6/53	Carpenters 6/52	Structural Ironworkers 6/53	Structural Ironworkers 6/52
Bombay, India[a,a]	Rs 4/12/6	0/8/0	0/8/0	0/6/0	0/6/6	0/12/0	0/12/0	0/12/0	0/12/0	1/4/0	1/4/0
Manila, Philippines[e]	2.00 pesos[e]	0.56	0.50	0.56	0.50	1.00[e]	1.00[e]	1.00[e]	1.00[e]	1.25[b]	1.25[b]
Melbourne, Australia[c,f]	9s	18/5/5[c]	16/8/7	18/5/5[c]	16/8/7	20/10/0	19/2/3	20/10/0	19/2/3	15/18/4[d]	14/16/8[d]
Sydney, Australia[c]	9s	.....	.....	15/18/4	.....	16/10/0	.....	16/16/8	.....	.....	.....
Tokyo, Japan[a]		56.00	50.00	46.00	41.25	75.00	62.50	69.00	62.50	69.00	62.50

•a 8 hr day •b rate per hour. Other hourly rates: common labor on bldg, 7/11.5; bricklayers 8/3; carpenters, 8/5 •c per week—40 hrs •d base rate. Actual cost[d] higher—see footnote f •e rate for selling dollars. Rate for buying dollars is 2.34 p/$1 US •f all rates except struct irnwkrs incl. paid holidays, tool allowance, special payroll taxes, statutory and unofficial additions. Base rates 6/53: common labor bldg, 13/19/2–14/8/4; com labor hvy constr, 14/8/4; bricklayers, 15/18/4; carpenters, 15/19/2; SIW, 11/12/0–15/18/4

Ranges •A 0.75–1.00 p •B 1.00–1.25 p •C 17/13/9 to 18/5/5, depending on skill •D 11/12/0 to 15/18/4

MATERIALS PRICES IN NATIONAL CURRENCY F.O.B. CITY, JUNE '52 AND JUNE '53

City	Structural steel per ton 6/53	Structural steel per ton 6/52	Reinf. steel per ton 6/53	Reinf. steel per ton 6/52	Portland cement per ton 6/53	Portland cement per ton 6/52	Lumber 2 x 4 s4s per M ft bm 1st class pine 6/53	Lumber 2 x 4 s4s per M ft bm 1st class pine 6/52	Lumber 2 x 4 s4s per M ft bm 2nd class pine 6/53	Lumber 2 x 4 s4s per M ft bm 2nd class pine 6/52	Local equivalent 6/53	Local equivalent 6/52
Bombay, India[b]	500/–/–[b]	500/–/–[b]	480/–/–[b]	400/–/–[b]	105/–/–[b]	112/–/–[b]	12/–/–[a,m]	12/–/–[a,m]	9/–/–[a,m]	10/–/–[a,m]	.....	.....
Manila, Philippines[e]	800[e,d]	950[e,d]	430[e]	400[e]	3.20[f,e]	3.20[f]	320	350	.....	.....	200[e,f]	220[e,f]
Melbourne, Australia	35/0/–[b]	35/0/0[b]	35/0/0[b]	32/10/0[b]	10/8/9[b]	9/12/3[b]	9/0/0	8/3/0	.....	.....	5/4/0	5/2/0
Sydney, Australia	.....	.....	.....	.....	11/7/6[g,f]	.....	0/258.0[g]	.....	.....	.....	0/127/6[g]	.....
Tokyo, Japan	65,000[c]	68,000[c]	39,500[c]	39,500[c]	8,800[c]	8,960[c]	3,000[c]	2,700[c]	2,500[c]	2,200[c]	.....	.....

•a per cu ft •b per long ton, 2240 lb •c per metric ton, 2240 lb •d Tasmanian NSW: 6/52, 10/12/3; 6/53, 13/17/6 to 18/10/0. Imported: 6/52, 18/0/0 to 20/0/0; 6/53, 13/17/6 to 17/5/9. Local cement used only on housing. Tasmanian used little. English can be imported for as low as 13/17/6 •e Sales tax on all materials •f per 94 lb bag •g teak, local standard, sawed •h teak, local standard, unsawed •i per koko, 1' x 1' x 10' •j 10 tons or more •k rate for buying dollars: 2.34 p/$1 US •l 3½% sales tax on materials •m Indian teak wood 1st cl •n Indian teak wood 2nd cl •o black market price: 5.50 p. •p native hardwood, unseasoned •q Oregon, merch, per 100 ft sup.

Ranges •A 1800–2500 rupiahs per ton •B 1550–2100 rupiahs per ton •C 1600–2400 rupiahs •D 650–800 p •E 900–950 p •F 180–220 p •G 32/10/0 to 35/0/0

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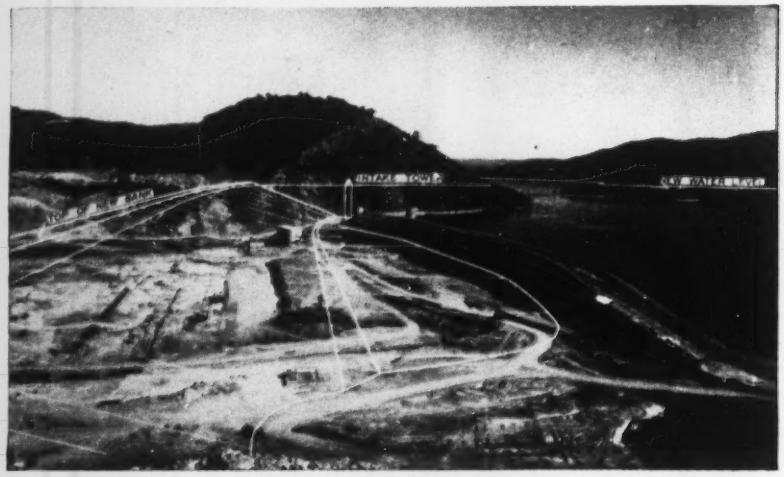


PRESENT DAM WILL BE FLOODED OUT when Australia's new Eildon Weir—to be biggest on the continent—is completed. Project is for flood control and irrigation.

to compete with the local contractors on their home grounds.

In Burma, the story is different again. In this lush country little or no actual construction work is under way—but planning for it envisages expenditure of something in the neighborhood of $1.5 billion.

In general, the Far Eastern situation might be summarized this way:

The supply of capital is fair in spots. Common labor is plentiful, skilled labor scarce (but the natives are very quick to learn). Materials are generally available, machinery badly needed. Technical help—plentiful and generally good in special fields. Attitude—mostly good. Local governments—rather surprisingly stable.

Area-by-area the detailed situation is:

▸Australia

Nearly everybody concerned with construction in Australia expresses surprise that U. S. contractors have shown such a limited interest in what appears to be a good market for their services.

Australians add up their continent's case for attracting U. S. construction men this way:

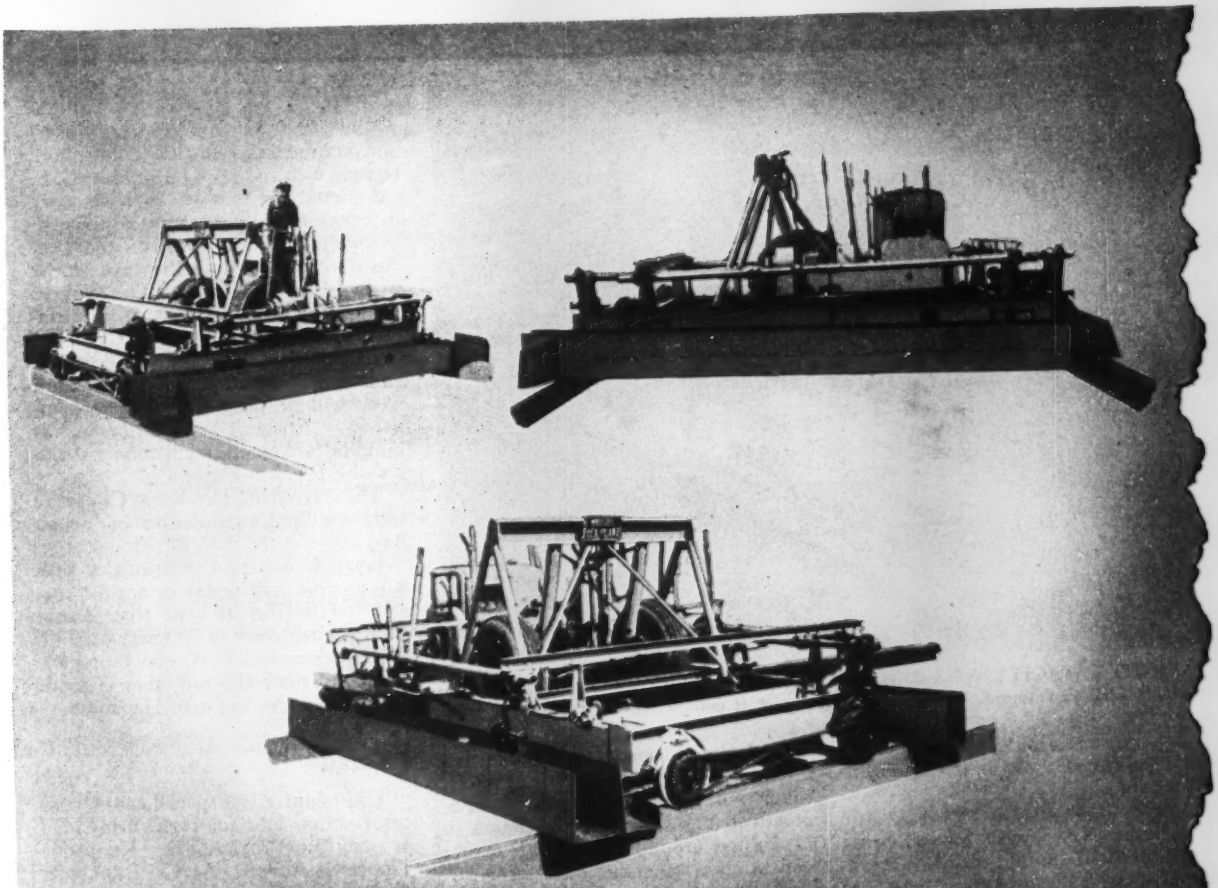
Australia offers prompt payments in dollars, stable contracts and encouraging economic and political conditions, with a government that views favorably all sorts of U. S. activities. More, the nature of some of the huge programs in contemplation makes it imperative to employ contractors who can proceed and finish the work in the shortest possible time.

And observers add up the discouragements this way: Labor markets that were so tight a few years ago that contractors had to figure on importing all their help have loosened quite a bit—but you still have to pay more to get men to go to the usually difficult places where work must be carried out; wages are still mounting—though not as fast as previously; Australian materials are more plentiful and often cheaper—but because they're cheaper they're becoming harder to get. And in addition, Australia's liberal labor laws provide some peculiar hidden costs: Such unorthodox holidays as the first day of a big race meeting and local fairs and expositions.

But the few U. S. contractors now working in Australia report good relations locally, both with labor and with local contractor and governmental organizations. And—say the Australians—right now there are pieces of the big $130-million Snowy Mountain Scheme still open for bids.

At the moment, U. S. firms are working on these projects:

- Eildon Weir—to be the continent's largest dam (to store 2,750,000 acre-ft. of water and irrigate 360,000 acres of land, in an area about 80 miles from Victoria). Contractor for the Victorian State Rivers and Water Supply Commission is Utah Construction Co. of San Francisco.
- Goulburn-Warranga No. 2 Main Channel—a 14 mile canal that will form the main section of irrigation expansion—will follow upon completion of Eildon Weir. The canal is being built as a joint venture by McDonald Construction Pty., Ltd. of Melbourne, and Morrison-Knudsen Inc.
- Warragamba Dam—a $30-million project to ease Sydney's tightening water supply situation, being built by the Sydney Metropolitan Water, Sewerage and Drainage Board. John L.



YOU'RE LOOKING AT THE MOST MOBILE CONCRETE FINISHER IN THE WORLD . . . .

Here are three views of one of the most heralded machines in highway and airport construction history. It's the super portable Flex-Plane Detroit Special Finishing Machine.

Wherever one of these machines is in operation you'll discover the contractor using the machine has been able to work faster at less cost.*

Completely portable, the machine will lift itself from the forms and convert itself into a "trailer" in a minute . . . ready to be taken to the next job with a minimum of make-ready and idle crew time.

THE SUPER PORTABLE FLEX-PLANE DETROIT SPECIAL

Special screeds and screed mounts enable this speedy machine to finish any type surface in the manner specifications call for. Both screeds are mounted outside the frame which permits faster screed changes. Machine is telescopic . . . can be altered to fit any size job in approximately 15 minutes. If you are in the business of building concrete streets, highways or landing strips, you can't afford to overlook this cost-cutting finisher. To get all the facts drop a note on your company letterhead to the Flexible Road Joint Machine Company, Warren, Ohio, today.

* *Ask for name of contractor nearest you operating a Detroit Special — talk to him about the quality of work, the speed and the savings he has been able to get by using this great machine.*

Cable Address: Flex-Plane

FREIGHT CAPACITY WILL DOUBLE at Auckland, New Zealand, when this 1,200 x 300-ft earthquake-proof, reinforced concrete pier is completed.

Savage, U. S. consultant is the board's principal advisor on design and construction.

• Snowy Mountains hydroelectric scheme in New South Wales, being built for the Commonwealth Government of Australia—in two sections, the first of which will cost about $60 million and will include Adaminaby Dam, to store 3.2 million acre-ft of water, produce 320,000 kw of electric power, supply water for 20,000 farms. Engineering advice came from Mr. Savage and many engineers lent by the U. S. Bureau of Reclamation.

Additionally, Kellogg International Corp., a branch of the M. W. Kellogg Co., New York, is building a $120-million oil refinery at Kwinana, Western Australia, for the Anglo-Iranian Oil Co.; and Braun Transworld Corp. is building a refinery at Melbourne.

▸ Burma

Although only preliminary engineering survey work is under way, rich Burma has recently signed a two-year contract with Knappen, Tippets, Abbett, McCarthy for a two-year survey of the country's potential that envisages an eventual expenditure of more than $1.5 billion, with particular emphasis on hydro power, irrigation and drainage for all major rivers, and complete investigations of the mining potential, restoration and improvement of port and harbor facilities, extension and restoration of railway and highway nets.

And the Burmese government has engaged Litchfield, Whiting, Panero, Severud & Associates of New York as architect-engineers and consultants in a planned hospital and health center construction program.

▸ Indonesia

Somewhat similar in purpose and extent to the Burma survey, the government of newly independent Indonesia has engaged the J. G. White Engineering Corp. of New York to give advice and consultation in planning of a balanced economic development; design and engineering services for the program evolved; and supervision of construction and purchasing services.

▸ Formosa

A group of Bureau of Reclamation engineers, headed by W. A. Dexheimer, former assistant chief construction engineer for the bureau and the newly appointed Commissioner of Reclamation, has recently visited the island to investigate construction of what may be the highest dam in the Far East, to be known as the Wu Sheh Project. J. G. White Engineering Corp. is also engaged in this work.

The dam—originally planned during Japanese occupation of the island in World War II—would bolster Formosa's power potential, particularly important in the manufacture of fertilizers needed to produce foods for the swollen Formosan population.

▸ Japan

Outside some American engineers and contractors who are doing work for our own military, only three U. S. contractors are known to have work in Japan. One job is part of a projected $78-million development on the Tenryu River in Shizuoka Province on the main island of Honshu. The Guy F. Atkinson Co., San Francisco will supply machinery and equipment not available in Japan, and advice and guidance as to use. Actual construction work will be done by Japanese companies. Ebasco Services, Inc., is building a concrete arch dam for the Kyushu Electric Power Co.

The Hawaiian Dredging Co. is at work on land reclamation in Tokyo Bay.

Japan is one of the countries that has no rules either for or against foreign contractors (except that Americans probably would be taxed both by the Japanese and U. S. governments). Supply of materials and labor is good.

But there are too many Japanese.

▸ Korea

This country is a special case where construction jobs for U. S. firms may or may not materialize. Knappen, Tippetts, Abbett, McCarthy, New York, have been hired to formulate a United Nations program that contemplates spending $70 million or so to rehabilitate the war-torn nation. There is of course much military construction—but most of it is being handled directly by the services.

▸ Siam (Thailand)

Only major project—for which funds were supplied largely by the World Bank—is one that the Siamese government is undertaking by itself. The work is dredging the harbor of the country's principal port—Bangkok, which is heavily silted by the Chao Phya River.

(*Continued on page 106*)

ROUGH COUNTRY is site of Ambuklao Dam in the Philippines.

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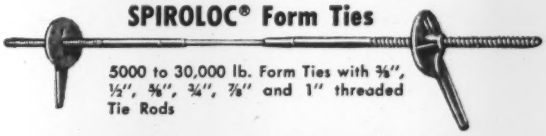

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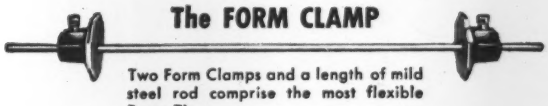
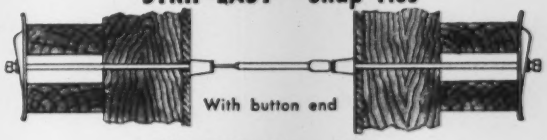


Two Form Clamps and a length of mild steel rod comprise the most flexible Form Tie

"STRIP-EASY"® Snap Ties



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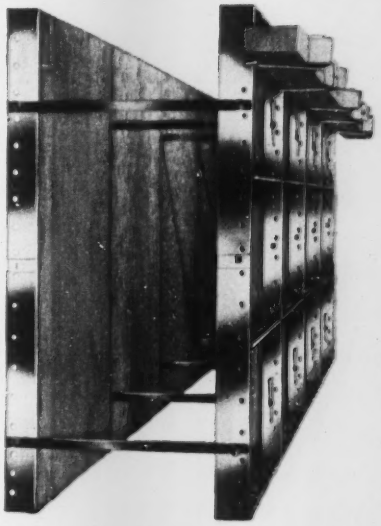

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Low-Cost Diesel Power begins with the basic simplicity of GM Diesel's 2-cycle design. Here GM engineers and draftsmen incorporate new materials and develop new designs to improve performance and lengthen the life of GM Series 51, 71 and 110 engines. They also engage in constant search for better methods of manufacture to further improve quality and at the same time reduce costs.

The DIFFERENCE in Diesels Starts Here

First, there's a basic difference between Diesels and other types of engines. Diesels ignite their fuel by the heat of compression alone—must be built extra rugged to withstand combustion pressures of Diesel operation, with fuel-saving compression ratios up to 18 to 1.

Second, there's a difference between General Motors Diesels and other Diesels. The GM Diesel is a *two-cycle* engine—produces power at *every* piston downstroke, not every second downstroke as do four-cycle Diesels. This means more power per pound and cubic foot of engine and faster response to loads.

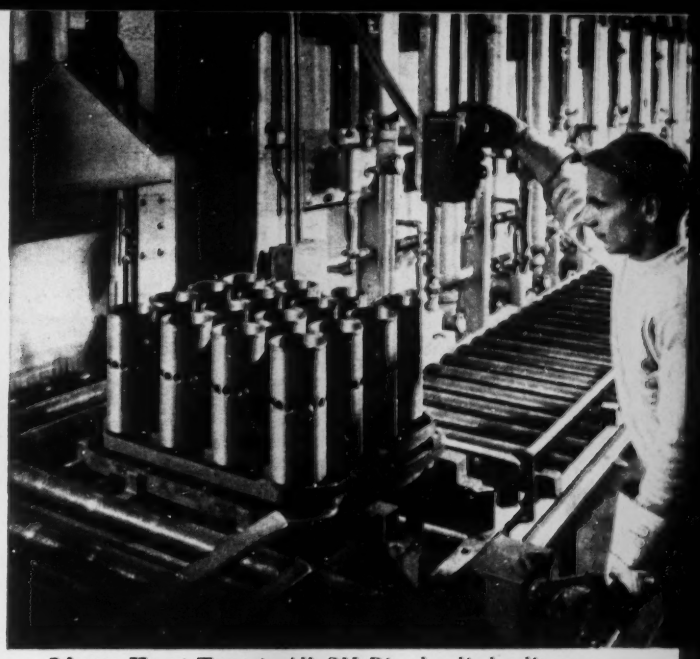
Add to superiority of basic design the painstaking care we employ in every stage of manufacture, and you see how GM Diesels are engineered and built to stand up under the most strenuous operating conditions 24 hours a day, 7 days a week, month after month after month.

DETROIT DIESEL ENGINE DIVISION

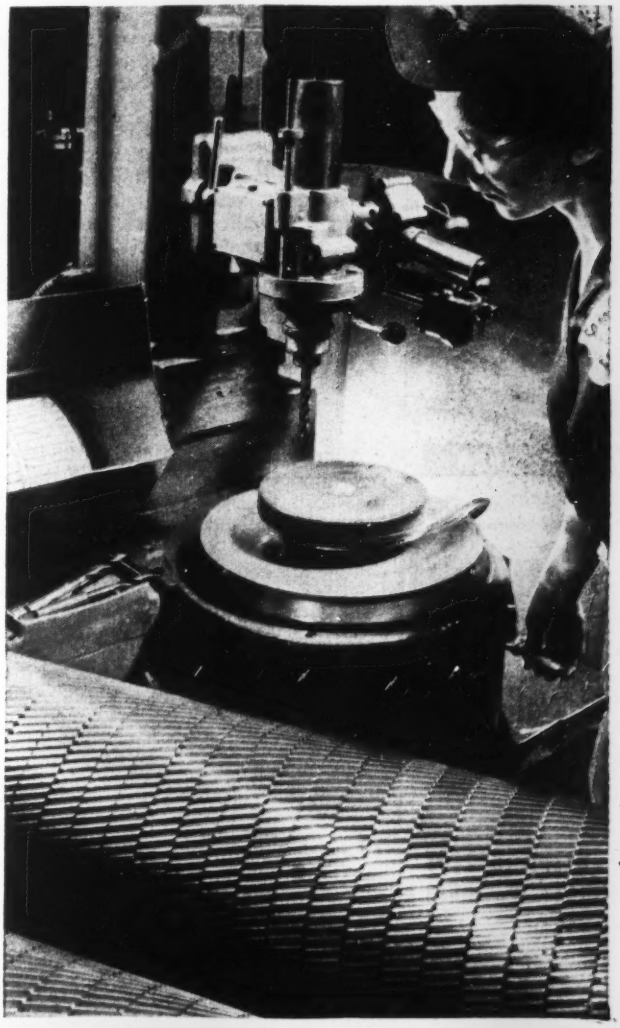
GENERAL MOTORS • DETROIT 28, MICHIGAN

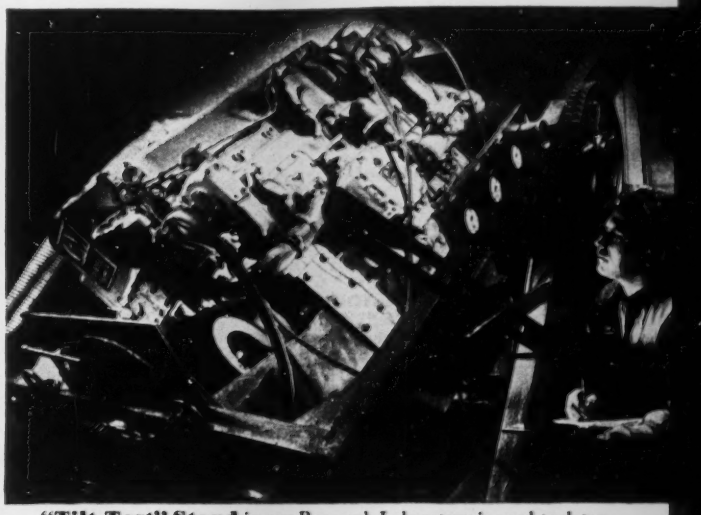
Material Analysis—In our completely equipped metallurgical lab, we recheck the chemical properties of all materials, including metal in castings and forgings furnished by suppliers. This is done so that machining and other processing methods can be perfectly matched to the characteristics of the materials.

Connecting Rod Inspection—At this final "Quality Control" station, inspectors double-check on process inspections made earlier. Balancing the rods, and carefully controlling the weight of both ends, is one factor in the interchangeability of parts which makes possible low-cost mass production.



Liner Heat-Treat—All GM Diesel cylinder liners are precision-hardened in this continuous, automatic heat-treating furnace specially designed by GM engineers. This is one reason, for example, why GM Diesel-powered buses commonly travel 150,000 to 200,000 miles between engine overhauls.





"Tilt-Test" Stand in our Research Laboratory is used to determine the effectiveness of the lubrication system with the engine tilted at extreme angles. Studies like this have contributed to the development of the new spacesaving "inclined" Marine Diesels, as well as the side-mounted "110" Diesels powering Budd Rail Cars.

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Single Engines . . . 16 to 275 H.P.
Multiple Units . . . Up to 840 H.P.

Gear Balancing—On machines like this, many of them developed by General Motors Research, all-steel gears and other rotating parts of GM Diesel engines are brought into perfect individual balance. An electronic indicator to the left shows the operator where weight must be taken off.

UP and READY to go in 23 minutes!

Save hundreds of dollars on move after move!

BUCK
Automatically-Portable Heavy-Duty
HOISTING MACHINE

CONTRACTORS REPORT THESE AVERAGE SAVINGS OVER OTHER HOISTS!

Cost per job OTHER HOISTS
Moved in . . . erected . . . dismantled and removed — by 2 to 5 men in a matter of hours — at cost of $200.00 to $400.00 per job.

Cost per job BUCK HOIST (automatically-portable)
Moved in . . erected . . lowered and removed —by one man—at cost of only $30 per job!

Here's Why the BUCK Automatically-Portable, Heavy-Duty Hoisting Machine Saves You Time and Money on Job after Job:

AVERAGE SAVING $170 to $370 PER MOVE over other hoists!

Easily towed — even by a pickup truck — your BUCK is pneumatic trailer mounted . . . has finger-tip balance. One man makes the move — quickly . . . easily!

Ready-rigged, self-erecting, self-lowering tower unfolds like a jack-knife. It's the only complete automatically-portable, heavy-duty hoisting machine in the world!

Completely set up and ready to operate in only 23-minutes . . . instead of hours! One man does the whole job! It raises 2000 lbs. at 100 feet a minute.

Self-dumping ½ cu. yd. BUCK Concrete Bucket and 12-ft. Chicago-type boom available.

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Far East

• Philippines

Here is the Far East country where Americans have most friends and most work to do. Despite this fact, doing work in the Philippine Republic is still extraordinarily difficult.

To the Filipinos, there are three kinds of "American contractors": The old-line firms that had offices there before World War II, the ex-GI who invested his mustering-out pay in Army equipment he could buy cheaply in the Islands; and the newer State-side firms that come in for a job, do it, then disappear again.

Each is treated differently under the much criticized "flag law" of the republic.

Similar in intent to "Buy American" laws, it gives native firms a 15% advantage when bidding for government work. (Theoretically, an amendment to the Constitution passed in 1946 gives U. S. citizens—for 28 years—all rights and privileges enjoyed by Filipinos. But the "flag law"—written earlier—has been invoked now and then in apparent disregard of the constitutional parity clause. This circumstance hasn't arisen often, because most of the postwar government projects have been financed to some extent with U. S. funds on condition that no discrimination be exercised in letting contracts.)

Nevertheless, the "flag law" retains some disconcerting features not always obvious: In one major public building job, no single local contractor was big enough to handle the work—so a combine was formed, which ended by bidding such a high figure that the job had to be re-advertised abroad, and finally went to an American firm, after much delay. A bill has been drafted for the Island legislature to correct this trouble—but with an election coming up, it is given no chance of passage this year.

Added to this is the fact that the larger American firms are worse off than the locals in slack times—they must pay top mainland personnel four or five times what competent Filipinos command, grant long leaves, family transport and other amenities.

But the government is trying hard to equalize the situation, and live up to its commitment to the U. S. One law recently signed onto the books abolishes various tax levies which had been imposed on military base construction work. And, so far, U. S. and Filipino contractors have shared the market without outside competition.

• **Large Filipino jobs** on which American firms are hard at work include:
• The Ambuklao project—a huge hydro

Far East

and multi-purpose job, which will include construction of the world's highest rockfill dam, a diversion tunnel and other work, to cost $50 million. Guy F. Atkinson Co., San Francisco has a $22-million contract on Ambuklao, with the Harza Engineering Co., of Chicago, as consultant to the owner—National Power Corp. of the Philippines. On the same project, the Marsman Construction Co., of San Francisco, holds a contract for construction of access roads.

• A $30-million two-stage crude oil distillation unit of 13,000 bbl daily capacity is being built by Foster-Wheeler Corp. for Caltex Philippines Inc., at Bauan, Batangas Province.

• Oscar Van Kohorn & Co., Ltd. of New York is building a $2.5-million integrated bagasse pulping, rayon spinning, weaving, dyeing and finishing plant for the Rayon Corp. of the Philippines, at Ma-ao, Negros Occidental Province.

• Hailed as the biggest job in the Pacific, at the moment, is a $60-million project at Cubi Point on Subic Bay—an airstrip, naval facilities and other work. The work is being done by Contractors Mid-Pacific, which includes: Hawaiian Dredging Co., Honolulu; J. H. Pomeroy, Inc., San Francisco; and the Bechtel Corp.; San Francisco. Architectural and engineering services are being performed under a separate lump sum contract by Bechtel.

▸New Zealand

Here again is a part of the English-speaking world not unfriendly to Americans, but with a short labor supply and a good supply of local technical talent.

New Zealand, also, has been passed up by Americans in recent years because of extremely liberal labor laws (much like Australia's) and extremely rigid laws governing the import of personnel. However, recent changes in government viewpoints indicate an easing of these restrictions may be due—at least for the special work that American contractors are peculiarly fitted to do.

• Two American contractors—Raymond Concrete Pile Corp. and Merritt-Chapman-Scott Inc., both of New York—are at work on major expansions to the dock system at the port of Auckland.

• Morrison-Knudsen is building the 5¼-mile Rimutaka Tunnel for the Wellington-Wairarapa Railway.

• The Preload Company, Inc., New York is building four prestressed concrete reservoirs in as many cities, under contracts totaling $350,000.

Prestressed Concrete —International

THROUGH its fifteen strategically located foreign offices, The Preload Company, Inc., offers to the construction industry a worldwide organization of specialists in the most modern techniques of prestressed design and construction.

Among the major projects in prestressed concrete designed or built abroad in 1952–53 through Preload's foreign offices are:

- Three bridges with lengths of 50, 48 and 135 meters for the Brazilian Navy.
- Bulk fuel storage tanks with capacities totaling 250,000 barrels for overseas installations of the U. S. Air Force.
- Tanks with capacities totaling 28,000,000 gallons for irrigational and water supply projects of the State of Israel.
- Oil storage tanks with capacities totaling 250,000 barrels for the Conselho do Petroleo of Brazil.
- A bridge with a length of 130 meters at Aconcagua, Chile.
- Six service supply reservoirs with capacities totaling 3,000,000 gallons for the city of Wellington, New Zealand.
- Other liquid storage tanks with capacities totaling 93,000,000 gallons in France, England, Algeria, Tunisia, South Africa, Canada and Australia.

Foreign Offices

The Preload Central Corporation
GPO 2983, Auckland, New Zealand

Foreign Associates

Preload Corporation (Australia) Pty., Ltd.
85 Buckland Road, Nundah,
Queensland, Australia

Cia. Brasileira de Construcoes Preload
Avenida Rio Branco 14, Rio de Janeiro,
Brazil

The Preload Company of Canada Limited
7325 Decarie Boulevard, Montreal, Canada

Preload Chilena Ltda.
San Antonio 255, Santiago, Chile

The Preload Company de Colombia, S. A.
Apartado 4905, Bogota, Colombia

Preload France, S. A. R. L.
154 Boulevard Haussmann, Paris, France

Preload (Great Britain), Ltd.
5 Stanhope Gate, London, England

Preload Near East Company, Ltd.
63 Atzmauth Road, Barclays Bank Bldg.,
Haifa, Israel

Preload South Africa (Pty.), Ltd.
P. O. Box 5927, Johannesburg,
South Africa

Preload Uruguay, S. A.
Bompland 541, Montevideo, Uruguay

Preload de Venezuela, S. A.
Edificio Atlas 202, Apartado 2079,
Caracas, Venezuela

Foreign Representatives

J. G. Bodhe, Consulting Civil Engineer
24-26 Dalal Street, Fort, Bombay, India

Industrial and Engineering Enterprises Company
23 Soliman Pasha Street, Cairo, Egypt

Universal Engineering and Trading Company
41/196 King Faisal II St, Baghdad, Iraq.

Literature on Preload methods of design and construction involving bridges, buildings, tanks and other linear and circular structures are available from any of these offices on request.

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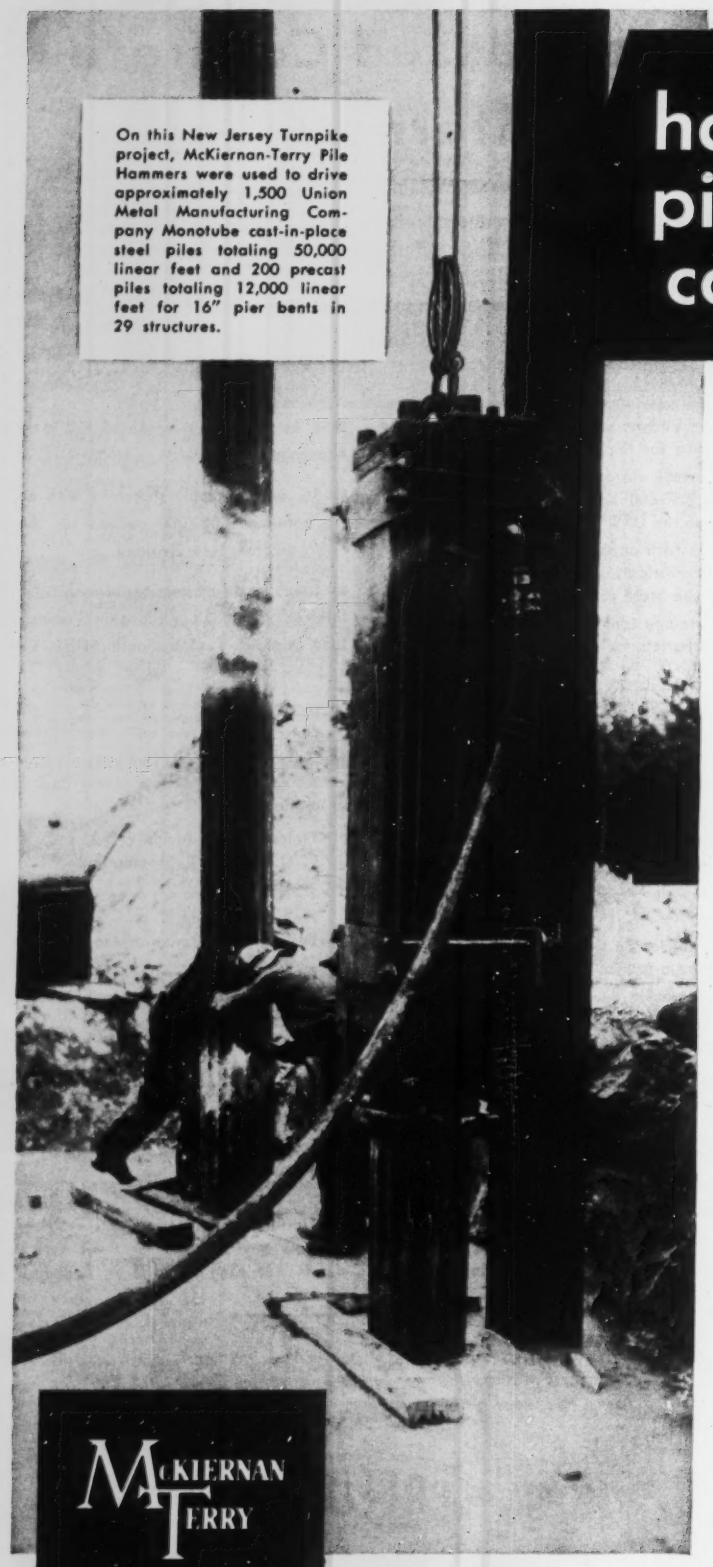

On this New Jersey Turnpike project, McKiernan-Terry Pile Hammers were used to drive approximately 1,500 Union Metal Manufacturing Company Monotube cast-in-place steel piles totaling 50,000 linear feet and 200 precast piles totaling 12,000 linear feet for 16" pier bents in 29 structures.

hard pile driving conditions...

...but McKiernan-Terry Hammers helped to finish project ahead of time

The contractor's own words tell this story best. S. J. Groves & Sons Company reports: "We used three McKiernan-Terry 9-B-3 Double-Acting hammers and one McKiernan-Terry Double-Acting 11-B-3 hammer in the construction of 21 miles of the New Jersey Turnpike in Gloucester and Salem counties. *The driving was unusually hard*, the foundation being water-bearing sand and gravel in the pier foundations and compacted fill for the abutments. *The McKiernan-Terry Hammers stood up very well under this severe driving and we are well pleased with the performance of the hammers.* The work was completed ahead of time."

No wonder contractors all over the nation rely on the power and dependability of McKiernan-Terry equipment. The wide-range McKiernan-Terry line includes 16 sizes of pile hammers and 2 sizes of pile extractors. Write for Bulletin.

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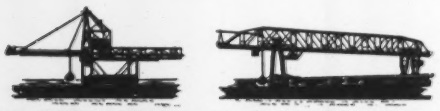
Other McKiernan-Terry Products



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MK-331

One Sure Way to Get MORE DEFENSE FOR LESS MONEY

How can we get more national defense for less money? The best answer yet given to this question appears in a little-noticed section of the new defense budget. That answer, with which this editorial is concerned, is to provide more equipment with which to step up munitions production in an emergency. Thus we can eliminate much of the need to stockpile finished munitions in advance.

The new defense budget provides an appropriation of $500 million, to be invested by the Secretary of Defense in specialized facilities required to produce munitions on a wartime scale, but not adapted to profitable operation by private industry in normal times. Facilities of this type are known as "stand-by capacity."

There is no strictly political controversy over the "stand-by capacity" program. It was originally suggested by Clay Bedford, Special Assistant to the Secretary of Defense during the Truman administration. It has since been reviewed and endorsed by the Eisenhower administration. Moreover, it involves little or no technical controversy. Civilian and military experts are well agreed that the only alternative to enormous expenditures for stockpiling military equipment is to provide enough facilities for producing it quickly in an emergency.

Here is the Key Idea

In his speech of May 19, introducing his defense budget to Congress and the nation, President Eisenhower stressed the value of such reserve capacity in these terms, ***"The more swiftly and smoothly we can mobilize, the less our dependence upon costly standing armies and navies."***

In accord with this idea, the $500 million requested for the present reserve capacity program would be invested in tools that require a long time to produce, and so present grave complications in an emergency unless they are ready in advance. Some such tools would be installed in new plants that are needed to eliminate potential bottlenecks in the defense production program. Others would be ordered to replace that part of the government's present machine-tool inventory which is made obsolete by changes in the design of defense products. By completely "tooling up" with the most modern equipment, the admin-

istration hopes to realize a production potential many times greater than could be achieved by spending the same amount of money on military end-products.

Examples of Savings

In the specialized field of defense production, adequate modern capacity is the key to both economy and speedy delivery in a pinch. Here are some striking examples from the recent report of the Advisory Committee on Production Equipment (Vance Committee) to the Director of Defense Mobilization:*

—In the case of certain ammunition components, the cost of new capacity can be recovered in only six weeks of full production.

—If $500 million worth of special tools needed to make aircraft are purchased in advance, aircraft production during the first two years of war will be increased about $18 billion. In other words, it costs 1/36 as much to acquire the tools in advance as to acquire the aircraft.

—In the case of a certain ordnance item, an expenditure equal to the cost of only 150 units of the item will provide the capacity to produce thousands and save three years' time in meeting mobilization requirements.

Moreover, reserve plants and equipment can be kept up-to-date at only a small fraction of the cost required to maintain an up-to-date reserve of military end-products. The cost of replacing 5,000 obsolete tanks is at least $1 billion. The cost of new tools for a tank plant would be less than 10% of that amount.

*This Committee, headed by Mr. Harold Vance, President of the Studebaker Corporation, included Clay Bedford, then President of Chase Aircraft, Manly Fleischman, former Defense Production Administrator, and several retired military leaders with wide experience in procurement.

Savings Will Multiply

On the basis of facts like these, the Vance Committee recommended that the Defense Department spend $500 million to $800 million per year on specialized defense production facilities in order to provide substantial reserve capacity as soon as possible. It also recommended that expenditures for military end-products which get obsolete rapidly be held to a minimum. The Eisenhower administration has adopted this approach to the problem of munitions production in asking that $500 million be invested in reserve capacity.

The importance of this approach is much greater than is indicated by the amount of money to be spent on new tools, although this amount will go far toward assuring a healthy machine tool industry, adequate to meet emergency demands. ***What is really important is the great saving that can eventually be made in the cost of our defense program by a modern tooling program.*** If we are to maintain this program for a long period, and if we are to pay as we go, we must have a low-cost program. No other plan to reduce and control the cost of a garrison economy can compare with the new approach suggested in the Vance Report and now embodied in the new defense budget.

Congressmen will do well to scrutinize all military appropriations carefully. They have a chronic tendency to be too big. But there should be no penny-pinching on investments in capital equipment that will pay out in as short a time as six weeks in a war emergency. It would be tragic if this opportunity for real economy were lost in the controversy over other aspects of the defense program. ***The tooling program is a key part of the Eisenhower effort to cut defense costs. It should be promptly approved.***

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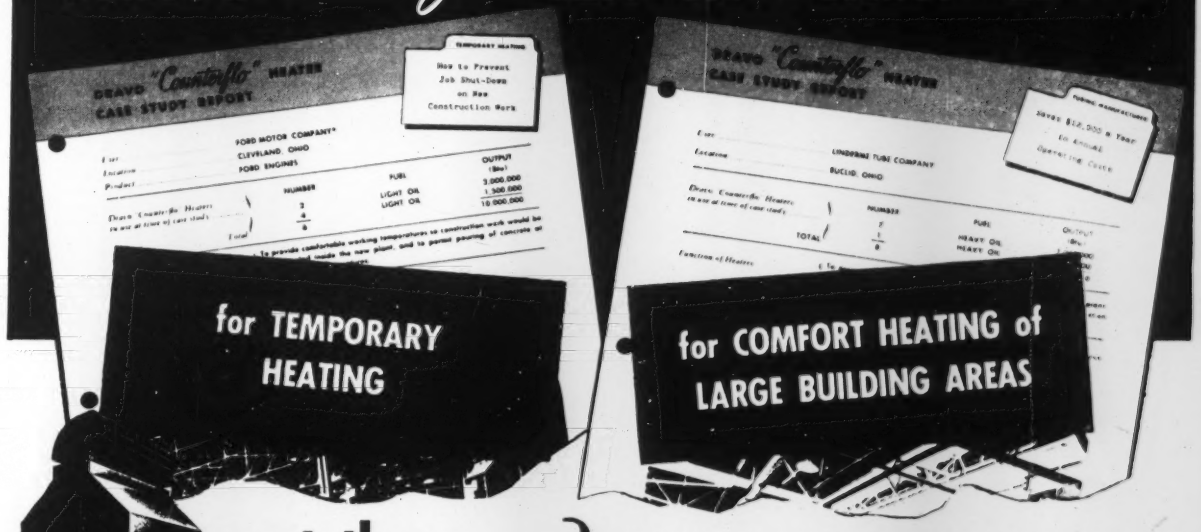

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Complied by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager.
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—BUILDINGS

Conn., Rockville—SCHOOL—B.A. 8/11—Town, School Bldg. Comn., Morgan Campbell, chn., Rockville. elementary school, East St. $665,000. Carl J. Malmfeldt & Assocs., 36 Pearl St., Hartford, archts. CD 11/12.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Consolidated Constructors, Inc.**, 897 Congress St., Portland, Me., LB. $770,932. Lot 1;

J. R. Cianchette, 120 Main St., Pottsfield, Me., LB. $77,881, Lot 2, bomb storage area, Limestone Air Force Base, Eng-19-016-53-81. LIMESTONE, ME. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids July 17. CD 6/26.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

M. DeMatteo Constr. Co., 200 Hancock St., Quincy, Mass. CA. $1,328,172, state highway constr., Provincetown and Truro. Bids July 7. CD 7/13, under LB.

M. DeMatteo Constr. Co., 200 Hancock St., Quincy, Mass. CA. $721,137 (Contractor may refuse contract because of error in bidding) for reservoir Putnamville Sect., Danvers, BEVERLY, MASS. Cities of Salem and Beverly, Salem Beverly Water Supply, c/o Salem City Treas., 93 Washington St., Salem, Mass. Bids July 3. CD 7/9, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Consolidated Constructors, Inc., 807 Congress St., Portland, Me., LB. $637,950. East Side Elementary SCHOOL, Fruit St., Garland St., and Mt. Hope Ave., BANGOR, ME. City, School Bldg. Comn., School Dpt., Bangor, Me. Eaton W. Tarbell & Assoc., 84 Harlow St., Bangor, Me., archts. Bids July 15.

J. A. Singarella Co., 15 Bay St., Dorchester, Mass. LB. $923,385. est. $1,050,000. The Country SCHOOL, off School St., WESTON, MASS. Town, School Bldg., Comn., J. W. Carter, secy., Town Hall, Weston, Mass. Bids July 15. CD 6/24.

City, Bd. Trustees, Boys Trade High School, W. B. Dinnen, dir., Grove St., Worcester, Mass., rejected bids June 25, Boys Trade HIGH SCHOOL shop, Lexington, Concord, Prescott and Grove Sts., WORCESTER, MASS. LB. $534,487. CD 6/30, under LB.

▲ **Wexler Constr. Co.**, 118 Needham St., Newton, Mass., LB. $1,813,000, MR-48 moderate rental HOUSING, NEW LONDON, CONN. City, New London Housing Auth., 97 Laurel Dr., New London, Conn. Bids July 15. CD 6/23.

▲ **F. D. Rich Constr. Co.**, 322 Main St., Stamford, Conn., CA. Est. $2,000,000 8 story, 115x224 ft. STORE and OFFICE, STAMFORD, CONN. Broad & Atlantic Streets Corp., c/o Alton Rheaume, 279 Park St., New Canaan, Conn., and Paul Sternbach, 336 Atlantic St., New Canaan, Conn., archts

MIDDLE ATLANTIC

BIDS ASKED—BUILDINGS

▲† **N. J., Fort Monmouth**—HOSPITAL—B.A. About 2/20—U. S. Eng., 80 Lafayette St., New York, 13, N. Y., 200-bed hospital. $1,000,000-$3,000,000. Extended date. Ziegler, Childs & Paulson, 921 Bergen Ave., Jersey City, archts. CD 2/18.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **J. Rich Steers Co.**, 17 Battery Pl., New York 4, N. Y., CA $2,286,766, imprv. Jones Inlet, incl. 1 mi. rock jetty, Nasau Co., CIVENG-30-075-53-36, NEW YORK. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Awarded July 17. CD 6/26, under LB.

▲ **NEW JERSEY and PENNSYLVANIA**—Delaware River Port Auth., Admin. Bldg., Bridge Plaza, Camden, N. J.,

Merritt-Chapman & Scott Corp., 260 Madison Ave., New York, 16, N. Y., CA. $3,400,410 constr. foundations for two anchorage piers of new 7-lane suspension bridge across the Delaware River between Phila., Pa. and Camden, N. J., Contr. No. 2. Bids July 13. CD 6/11.

▲† **Tecon Corp.**, 1201 Main St., Dallas, Tex., LB. $4,906,947, parking apron and taxiway, McGuire Air Force Base, Eng-36-109-53-403, WRIGHTSTOWN, N. J. U. S. Eng., 121 N. Broad St., Phila., Pa. Bids July 8. CD 6/11.

▲† **American Dredging Co.**, 12 S. 12 St., Phila., Pa., CA $2,970,850, maintenance dredging in Fairmount Pool Sect. Schuylkill River, Inv. No. CivEng-36-109-53-39. PENNSYLVANIA. U. S. Eng., 121 N. Broad St., Phila., Pa. CD 6/11, under LB.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore,

Geo. F. Hazelwood Co., Box 779, Cumberland, Md., LB, $787,388, Contract A-439 1-615, grading, drainage, wid'n. resurf. 3.328 mi. State Rt. 53 and part of Routes 49 and 663, Cresaptown, Alleghany Co. Bids July 14. CD 7/1.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Island Estates**, B. M. Robinson, pres., 100 E. 42 St., New York 17, N. Y., Own Forces, Total $10,000,000. RESIDENTIAL DEVELOPMENT, on Long Beach Island to be called Loveladies Harbor Estates, MANAKAWKIN, N. J. Sidney Shelov, c/o owner, archt. CD 5/22.

▲ **Brookhaven Homes**, 160 Long Lane, Upper Darby, Pa. Separate Contracts. $1,391,000. RESIDENTIAL development, Sproul Rd. and Baltimore Ave. SPRINGFIELD, PA.

† **U. S. Eng.**, 24 St. and Maryland Ave., Baltimore, Md., rejected bids May 7, climatic TESTING FACILITIES Part 1, environmental producting equip., Eng 18-020-53-46, ABERDEEN PROVING GROUND, MD. LB $898,898. CD 5/13, under LB.

▲ **Consolidated Engrg. Co. Inc.**, 20 E. Franklin St., Baltimore, Md., CA, Northwood DEPARTMENT STORE, 1,700 cars parking facilities, 200-car roof parking, BALTIMORE, MD. The Hecht Co., Charles and Fayette Sts., Baltimore, Md. Abbott Merkt & Co., 10 E. 40 St., New York, N. Y., archts. Daniel Schwartzman, 25 W. 44 St., New York, N. Y., assoc. archt. CD 7/16.

▲ **John McShain, Inc.**, 3 W. Franklin St., Baltimore, Md., LB, Est. $1,000,000 6 story, rein.-con., steel, block and 3 story wing ENGINEERING bldg., BALTIMORE, MD. Johns Hopkins University, 34 and Charles St., Baltimore, Md. Bids July 18. CD 6/25.

Lewisdale Builders, 2001 Amherst Rd., Lewisdale, Md., CA. $600,000. OFFICE and WAREHOUSES, Beltsville Industrial Center, BELTSVILLE, MD. Frank M. Ewing Co., 4511 Rhode Island Ave., Brentwood Md. Walton & Maddon, 3510 Rhode Island Ave., Mt. Rainier, Md., archts. Awarded July 13. CD 3/28.

▲† **Fischbach & Moore, Inc.**, 226 E. 41 St., New York, N. Y. CA. electrical work;

Frank A. McBride, 75 Spring St., Paterson, N. J., CA. heating;

August Arace & Sons Inc., 642 3 Ave., Elizabeth, N. J., plumbing;

Grinnell Co. Inc., 260 W. Exchange St., Providence, R. I., CA. fire protection system;

Ingersoll-Rand, Phillipsburg, N. J., CA. boiler room equipment work for new PLANT, NEWARK, DEL. Dpt. Army, Pentagon Bldg., Wash., D. C. Total cost $3,100,000. Chrysler Corp., 341 Massachusetts Ave., Detroit, Mich., will operate. CD 12/9/52.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

▲ Ala., Mobile—B.A. 8/19—City, 60 miles sanitary sewer lines, $1,800,000. J. B. Converse & Co., First Federal Savings Bldg., Mobile, engrs. CD 5/5.

BIDS ASKED—BUILDINGS

▲ Miss., Jackson—SCHOOLS—B.A. 8/6—Jackson Municipal Separate School District, 256 E. Griffith St., constr., Robinson Road High School, $1,000,000; Woodrow Wilson Ave. High School, $1,000,000. Plans deposit $50 each. CD 6/30, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Doyle & Russell**, 823 W. 21 St., Norfolk, Va., LB $3,030,562. Princess Anne County HIGH SCHOOL and stadium, Thalia, PRINCESS ANNE, VA Princess Anne County School Bd., Princess Anne, Va. Bids July 16. CD 6/29.

Case Lumber & Supply Co., Fountain Inn, S. C., CA $502,700, Negro HIGH SCHOOL, Fountain Inn, GREENVILLE, S. C. Greenville County School Dist., 520, 600 N. Main St., Greenville, S. C. Bids June 26. CD 7/9 under LB.

Ellis-Thompson Constr. Co., 901 N. Freemont St., Tampa, Fla. CA, $596,000 SENIOR HIGH SCHOOL, BARTOW, FLA. Polk Co. Bd. P. Instruction, Bartow, Fla. Bids July 8. CD 7/16, under LB.

Peyton Higgison, P. O. Box 402, Mobile, Ala., LB $718,460, Chickasaw Junior High SCHOOL;

Stanley W. Newman, P. O. Box 1646, Mobile, Ala., LB $573,575 Toulminville Junior High School, MOBILE, ALA. Mobile Co. Bd. Educ., Courthouse, Mobile, Ala. Bids July 14. CD 2/19.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Ind., Muncie**—B.A. 8/20—Bd. P. Wks., City Hall, Muncie, sewage treatment plant addn. and Bethel Ave. Interceptor, $3,400,000. Havens & Emerson, Leader Bldg., Cleveland, O., consult. engrs. Paul R. White, Muncie, city engr. CD 12/4/51.

BIDS ASKED—BUILDINGS

O., Cincinnati—POLICE STATION—B.A. 8/11—City, City Hall, police station fronting on Lincoln Park Dr. $600,000. Bernard Pepinsky, Union Trust Bldg., archt. T. J. Montgomery, city engr. CD 2/2.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Horvitz Co.**, Midland Bldg., Cleveland, O. LB $2,880,078, est. $3,650,000. roadbed for West Side Route of Cleveland Rapid Transit System, incl. retaining walls, two rein.-con. overpasses and rebuilding highway bridge at West Blvd., CLEVELAND, O. Cleveland Transit System, 1404 E. 9th St., Cleveland 14, O. Bids July 17. CD 6/30.

▲ **C & C Constr. Co. and Clifton Engrg. Co.**, 2001 E. Pontiac St., Fort Wayne, Ind., LB $2,143,996. est. $2,500,000. sewage treatment plant;

Getman Bros., 914 Phoenix St., South Haven, Mich. LB $842,642. est. $800,000, intercepting sewers. KALAMAZOO, MICH. City, Kalamazoo, Mich. Bids July 15. CD 6/12.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Clemmer Constr. Co. Inc.**, 134 E. Thornton St., Akron, O., LB $1,417,573. general const. Buchtel HIGH SCHOOL addn., AKRON, O. Bd. Educ., 70 N. Broadway, Akron, O. Bids July 8. CD 6/16.

▲ **United Industrial Constructors**, Greensboro, N. C. CA, $1,000,000. PLANT to produce phosphoric acid, sodium, tripolyphosphate and other phosphates, on 5-acres north of New Haven Rd. and south of Willey Rd., FERNALD, O. Virginia-Carolina Chemical Corp., 401 E. Main St., Richmond, Va.

▲† **General Electric Corp.**, Portsmouth, O., CA $3,410,000, electric motors for process facility;

Kuhlman Electric Co., 1000 26th St., Bay City, Mich. CA $2,144,000, unit sub-station;

Merritt-Chapman & Scott Corp., 260 Madison Ave., New York 16, N. Y., CA $2,001,000, constr. recirculating water sys. and appurtenances;

R. G. Smith Co., Inc., 1249 Dueber Ave. S. W., Canton, O., CA $161,450, installing cement asbestos wall siding on a process bldg., for Gaseous Diffusion PLANT (Subcontractors under Peter Kiewit Sons, Co., P. O. Box 268, Portsmouth, O.) for Atomic Energy Comn., 1901 Constitution Ave. N. W. Wash. 25, D. C., PIKETON and WAKEFIELD, O. Grand Total $7,716,450. CD 8/13, under CA

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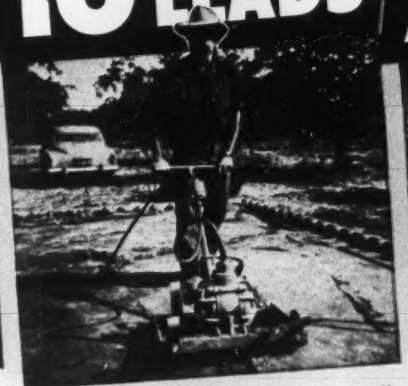

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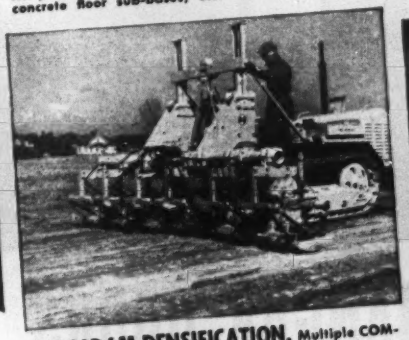

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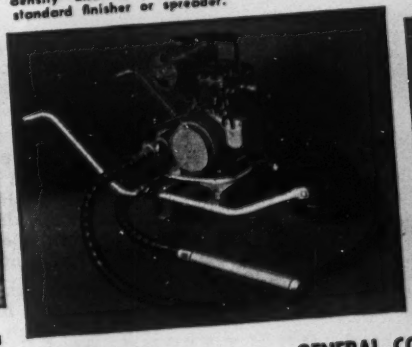
SIDE FORM VIBRATION. Works equally well mounted ahead of finisher screed or in rear of spreader. Controlled by finisher operator, it saves better part of two men's labor. Will not snag forms or reinforcements, or penetrate into sub-grade.

MUNICIPAL PAVING. This vibratory Screed strikes off to all crowns, undercuts at curb or sideform, works right up to and around obstructions. Only screed that can be rolled back for second passes on 4 rollers. Most productive and convenient screed made.



GENERAL CONSTRUCTION

(Left): 6 H.P. engine-driven, flexible shaft vibrator. Excellent for both thin and thick sections. (Right): 2½ H.P. electric vibrator (for light-socket operation). Handy as a pocket in a shirt, powerful enough to handle all general construction concrete vibration with shafts up to 28'.

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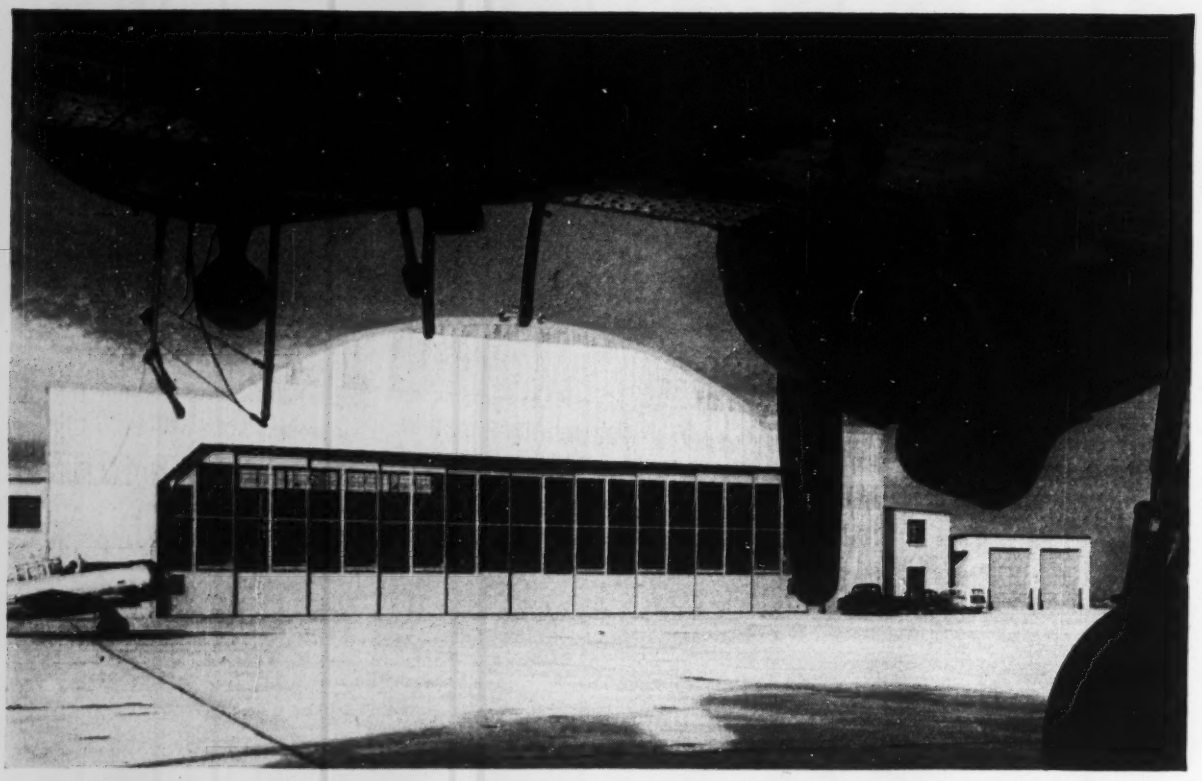

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Ready accessibility is built right into this Arizona Air National Guard Hangar in Phoenix—with motor-operated Truscon Straight Slide Doors. Johannessen & Girand, Engineers; J. G. K. Construction Company, Contractors.

Whatever emergency might strike, requiring planes in the air *fast* or planes safely undercover *fast* . . . the Air National Guard at Phoenix, Arizona, is always ready to respond. And helping to assure speed is the smooth, quick action of their Truscon Straight Slide Hangar Doors.

Product of over 27 years of specialized experience in the design and manufacture of hangar doors, Truscon Straight Slide Hangar Doors are the simplest and least expensive of all types. Equipped with out-of-the-way motor, they open and close with amazing speed, leaves rolling horizontally on roller bearing wheels.

Truscon Straight Slide Hangar Doors can be installed where limited headroom would bar other types. Monarails can be run close to the inside of these doors which never interfere with deluge sprinkler or lighting systems—always allow clearance outside and in for parking vehicles or planes right up to the opening.

In addition to Straight Slide Hangar Doors for motor or manual operation, the complete Truscon line includes Vertical-Lift Doors and Tail Doors, Vertical-Lift Canopy Doors, Braced Canopy and Unbraced Canopy Doors. To help you plan and *get* the best installation for any hangar, Truscon offers you the assistance of its experienced Door Engineers and field crews.

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▲ **Mellon-Stuart Co.**, 210 E. Park Way, Pittsburgh, Pa. CA **$3,529,840**. HOSPITAL addn. to provide 140 new beds. YOUNGSTOWN, O. St. Elizabeth Hospital, Sister M. Adelaide, supt., 1044 Belmont Ave., Youngstown, O. Bids June 11, Awarded July 14. CD 6/16 under LB.

▲ **Solomon Bodner & Assocs.**, Architects and Builders Bldg., Indianapolis, Ind., Owner Builds, **$1,400,000** OFFICE, 18 and Meridian Sts., INDIANAPOLIS, IND.

▲ **Geo. Sollitt Constr. Co.**, 109 N. Dearborn St., Chicago 1, Ill., CA, **$1,140,000** Algonquin Junior High SCHOOL and elementary school section, DES PLAINES, ILL. School District 62, Central St. and Thacker Rd., Des Plaines, Ill. Bids July 2, awarded July 10. CD 7/14, under LB.

▲ **Collins & Wilson Inc.**, 40 S. Lagrange Rd., Lagrange, Ill., CA, **$2,000,000**, aluminum rolling MILL new motor room, changes in tapered sheet mill, MCCOOK, ILL. Reynolds Metals Co., 2500 S. 3 St., Louisville, Ky. Bids June 17, awarded July 10. CD 6/12.

J. P. Cullen & Sons, Janesville, Wis., CA, **$812,494** general contract 5 story BACTERIOLOGY bldg., MADISON, WIS. University of Wisconsin, Madison, Wis. Bids July 2. CD 7/10, under LB.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

▲† **Tex., Kelly Air Force Base**—SHOPS—B.A. 8/25—U. S. Govt., c/o Dir. of Procurement, Bldg. No. 43, Kelly Air Force Base, San Antonio, base maintenance shop, J-104-34 and J-104-35. $1,750,000-$3,500,000. CD 9/19/52.

BIDS ASKED—BUILDINGS

Tex., Austin—MOTOR VEHICLE OFFICE—B.A. 8/13—State Hy. Dpt., State Bldg., Austin, 1 and 2 story 46,000 sq. ft. brick and insulated wall and panels, concrete and steel frame motor vehicle office bldg. $750,000. Plans deposit $25. Pager, Southerland & Page, 602 West Ave. and Jessen, Jessen, Millhouse & Greeven, 2616 Guadalupe St., archts. R. L. Rolfe, 2401-A Bryan St., Dallas and Zumwalt & Vinther, Mercantile Security Bldg., Dallas, engrs. CD 1/14.

SOON LETS CONTRACT—BUILDINGS

Tex., Abilene—OFFICE ANNEX—Abilene Hotel Corp., Abilene, soon lets contract 3 story, 140x200 ft. office annex and remodeling adjacent 2 story Windsor Hotel. $975,000. Tucker & Lindberg, 161½ Cedar St., engrs. and archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Nolan Bros., Inc.**, Box 5157, Fort Worth, Tex. CA **$1,985,557**. apron strengthening, Carswell Air Force Base, Inv. No. Eng-41-443-53-53, FORT WORTH, TEX. U. S. Eng., 100 W. Vickery St., Fort Worth, Tex. Bids July 7, awarded July 14. CD 7/10, under LB.

† **C. H. Leavell**, 1900 Wyoming St., El Paso, Tex., LB **$590,982**. aircraft maintenance hangar, Inv. No. Eng-29-005-53-144, LUBBOCK, TEX. U. S. Eng., Box 1538, Albuquerque, N. M. Bids July 10. CD 6/29.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **John B. Gutmann Constr. Co.**, 1301 S. Vandeventer Ave St. Louis, 10, Mo., CA **$3,138,000**. est. $5,500,000. general constr. 5 story bsmnt., X-shaped HOSPITAL and chapel (main block)-3-story wings, 3-story convent, boiler house addn. to Firman Desloge Hospital, boiler house, connecting tunnel to that hospital, etc. ST. LOUIS, MO. Cardinal Glennon Memorial Hospital for Children, c/o Archdiocese of St. Louis, Most Rev. Joseph E. Ritter, Archbishop, 3910 Lindell Blvd., St. Louis, Mo. Bids June 15, Awarded July 16. CD 6/29 under LB.

Brace & Carruth, 706 Garden Oaks St., Houston, Tex. Owner Builds. **$328,500**, 17 one and two story masonry DWELLINGS; **$305,000**, 14 two story masonry dwellings, concrete slab fdn., HOUSTON, TEX. CD 4/13/50.

E. J. Burke & Sons, Inc., 1100 Goliad Rd., San Antonio, Tex., Own Forces. **$304,000**, Unit 1, 38 dwellings, **$300,000**, Unit 2, 34 dwellings in 650-lot subdivision, SAN ANTONIO, TEX. CD 7/9.

† **Robert E. McKee, General Contractor, Inc.**, Box 1140, Los Alamos, N. M., CA. **$693,300**. FABRICATION FACILITY, Inv. No. 291-53-8, LOS ALAMOS, N. M. U. S. Atomic Energy Comn., c/o Ch. Procurement Sec., Los Alamos, N. M. Bids June 16. CD 6/24, under LB.

FAR WEST

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles, Calif.

Griffith Co., 1060 S. Broadway, Los Angeles, Calif. LB, **$3,060,396**, grading, paving 3 mi. 7 bridges, between Route 158 and north city limits of Los Angeles, Los Angeles Co.;

R. J. Noble, P. O. Box 602, Orange, Calif., LB, **$352,287** resurf. 10 mi. between Whitaker Ridge and 2.6 mi. south of Route 59, Los Angeles Co.;

Gordon Ball, San Ramon Valley and Co., and **J. M. Ferry**, Camille Ave., Danville, Calif., LB, **$286,443** grading, surf. 3.2 mi. Huntington Beach Blvd. between Garfield Ave. and Smeltzer Ave., Orange Co. Bids July 16. CD 6/24.

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†▲ **R. V. Lloyd,** Coachella, Calif., LB, **$2,606,574** earthwork, pipelines, structures etc., Unit 1 Delano-Earlimart Irrigation Dist. Central Valley Proj. Spec. DC 3980, CALIFORNIA. Bureau Reclamation Dpt. Interior, Lindsay, Calif. Bids July 16. CD 6/17.

▲ **Oakdale Irrigation District & South San Joaquin Irrigation District,** 322 D St., Oakdale 5, Calif., rejected bids Schedules 1, 2 and 3, Donnells Dam, Tunnel and Powerhouse, CALIFORNIA. Will re-advertise. CD 6/24.

† **Haddock Engineers Ltd.,** P. O. Box 390, Montebello, Calif., LB, **$567,000,** ballistics range facilities, Spec. 37797, NOY 77276, INYOKERN, CALIF. Officer in Charge of Constr., Bldg. 371 Naval Ordnance Test Station, Inyokern, Calif. Bids July 14. CD 6/24.

Fred J. Early Co. and Peter Kiewit Sons Co. 22138 S. Vermont Ave., Torrance, Calif., CA, **$874,875,** sewage treatment plant, SANTA ANA, CALIF. Orange Co. Sanitation District, 1, 2, 3, 5, 6, 7 and 11, 1104 W. 8 St., Santa Ana, Calif. Bids June 24, awarded July 9. CD 7/7, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Carson Park Builders,** Box 8086, Long Beach, Calif. CA. **$1,014,600,** 120 frame, stucco DWELLINGS on Peabody, Studebaker Rd., Carita and Sevely St., LONG BEACH, CALIF. Carson Park Mutual Homes No. 12, Box 8086, Long Beach, Calif. Paul L. Duncan, 13310 Moorpark St., Sherman Oaks, Calif., archt.

Stolte Inc., 8451 San Leandro St., Oakland, Calif., LB. **$587,431** District II OFFICE bldg., Div. of Hwys., REDDING, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento, Calif. Bids July 14. CD 6/24.

† **Lembke, Lembke, Clough & King,** P.O. Box 455, Albuquerque, N. M., CA, **$504,676,** SCHOOL facilities on Navajoe Reservation, SANOSTEE, ARIZ. Bureau Reclamation, Dpt. Interior, 19 and C Sts. N.W., Wash. 25, D. C. Bids June 30, awarded July 10. CD 7/8, under LB.

Proposed Projects——

WATER SUPPLY

▲ **N. C., Burlington**—City, WW imprvs. **$1,700,000.** Wm. C. Olsen, Raleigh Bldg. and Loan Bldg., Raleigh, consult. engr.

N. C., Greensboro—City, No. 3, water supply dam at Reedy Fork Creek. **$750,000.** Grady L. Bain, Banner Bldg., consult. engr. CD 1/26.

O., Toledo—Comrs. Lucas Co., Court House, Water Supply Line 400, Trilby and Westwood area, reinforcing main in Main Sewer Districts Nos. 4, 9 and 13. **$680,000.** Raymond Hall, Jackman Rd., co. sanitary engr. CD 9/26/49.

S. C., Andrews—City, WW imprvs. **$225,000.**

Tenn., Union City—City, water treatment plant. **$250,000.** CD 6/30/50.

Wash., Pasco—City, City Hall, exten. imprv. water system, **$500,000.** Cornell, Howland Hayes & Merryfield, 1600 Western Ave., Corvallis, Ore., consult. engrs. CD 11/20/50.

Alaska, Anchorage—Mountain View Public Utility Dist., Palmer Highway, voted bonds, extending water distr. sys., $300,000; deep wells, **$600,000.**

SEWERS, WASTE DISPOSAL

▲ **Ala., Montgomery**—City, City Hall, sewage treatment plant in Catoma Creek area, **$1,863,000** Wiedeman & Singleton, P. O. Box 1878, Atlanta, Ga., consult. engrs. CD 6/24.

▲ **Calif., Los Angeles**—Los Angeles County Sanitation District 21, 2020 Beverly Blvd. **$3,300,000** bond election Aug. 4, outfall sewers. A. M. Rawn, c/o owner, engr. Bond election Feb. 5/52 defeated. CD 1/9/52.

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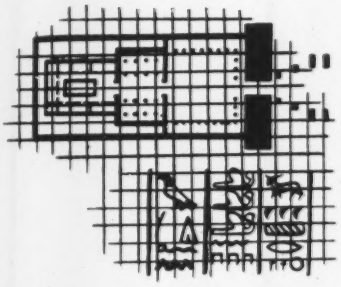

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Mass., Worcester—City, P. Wks. Dpt., 20 E. Worcester St., Contr. No. 5, sewage overflow regulators, diversion and backwater chambers, $350,000-$400,000 Camp Dresser & McKee, 6 Beacon St., Boston, consult. engrs. CD 5/27.

Mo., Monett—City, defeated $305,000 bonds, sewerage sys. imprvs. Riddle & Sharp, Finance Bldg., Kansas City, Mo., engrs. CD 7/2.

Nev., Las Vegas—City, 400 E. Stewart St., various trunk sewer lines, $600,000. Perilter & Soring, 448 S. Hill St., Los Angeles, Calif., consult. engrs.

Wash., Port Angeles—Sewer District No. 1, Port Angeles, sewers in district south of Lauridesen Blvd. $350,000. General Engr. Co., 4010 Stone Way, Seattle, Zone 3, consult. engr. CD 5/11.

BRIDGES

▲ O., Hamilton—City, bond election Nov. 3, underpass at South Hamilton R. R. crossing. $1,250,000. CD 9/5.

STREETS AND ROADS

▲ Ala., Mobile—City, City Hall, Sect. 3, street paving, $1,000,000, Palmer & Baker, Inc., Staples Pake Bldg., consult. engr.

▲ MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

Baltimore Co.—Baltimore Beltway to circle Baltimore from Expressway on South to hy. on north east, 6 lane hy., $40,000,000, Jos. K. Knoerle, Rummel, Klepper & Kahl, and Baker-Wibberley Co., 1606 Kelly Ave., Baltimore, assoc. consult. engrs.

Montgomery Co.—35 mi. expressway between Frederick and Wash., D. C. part of 12 year road program, First Contr. Germantown Rd. to D. C. line, $35,000,000. The Wilson T. Ballard Co., 824 N. Calvert St., Baltimore, consult. engr. CD 2/7/45, under Bridges.

▲ Ont., Toronto—Metropolitan Council of Toronto, City Hall, plan start 1954 east-west express hy. from Humber Bridge to Woodbine Ave. 4-6 lanes ground level or overhead. $20,000,000. CD 2/26/52.

AIRPORTS

† N. Y., Plattsburgh—NAVIGATION AIDS—U. S. Eng., 80 Lafayette St., New York, Zone 13, navigation aids Plattsburgh Air Force Base. $100,000-$500,000. Foster & Cafarelli, 44 Whitehall St., New York, engrs. CD 10/15.

N. Y., Rome—RANGE, etc.—U. S. Eng., 80 Lafayette St., New York, Zone 13, antenna proving range (FY 1953 II), $100,000-$500,000; NAV system test site (FY 1953 II), $100,000-$500,000, Griffiss Air Force Base. Alexander D. Crosett, 27 William St., consult. engr. CD 9/14/51.

† N. Y., Westhampton—WAREHOUSE—U. S. Eng., 80 Lafayette St., New York, Zone 13, plans by Gehron, Weiskopf & Pickworth, 101 Park Ave., New York, Zone 17, warehouse and cold storage warehouse, Suffolk Air Force Base. $500,000-$1,000,000. CD 9/14/51.

AMERICANS ABROAD

Chile, Santiago—Parke, Davis & Co., Joseph Campau Ave. at the River, Detroit, Mich., 1 story, 37,500 sq. ft. production laboratory, office and warehouse, Avenida de las Americas.

▲ Jordan—Cooperative Dpt. for Water Resources, Hashemite Kingdom of Jordan, Amman, hydro-electric and irrigation sys. for Yarmouk-Jordan River Valley Proj. $100,000,000. Michael Baker, Jr., Inc., Baker Bldg., Rochester, Pa., and The Harza Eng. Co., 400 W. Madison St., Chicago, Ill., U. S. A., consult engrs.

▲ Philippine Islands, Bauan, Batangas—REFINERY—Caltex (Philippines), Inc., (subsidiary Calif-Tex Oil Co., Ltd., 551 Fifth Ave., New York, N. Y.) Manila, Philippine Islands, has signed satisfactory pact with the Philippine Govt. and plans are to complete 13,000-bbl. refinery plant constr. late in 1954. $30,000,000. CD 6/27/52.

PUBLIC BUILDINGS

▲ Ark., Little Rock—SCHOOLS—Little Rock School Bd., 8 and Louisiana Sts., plans by Swain & Allen, Gazette Bldg., 32nd McKinley White Junior High School, $792,000; plans by Ginocchio, Cromwell & Assoc., Hall Bldg., Highway 10 White Junior High School, $792,500; plans by Erhart, Eichenbaum & Rauch, Wallace Bldg., Negro Junior High School, $792,000; plans by Bruce R. Anderson, Wallace Bldg., Booker Homes Elementary School, $376,000. CD 3/30.

Idaho, Pocatello—COUNTY, JAIL—Bannock Co., Court House, plans by R. S. Hunter, Dietrick Bldg., county bldg. and jail, $750,000. CD 6/5.

Md., Towson—SCHOOL—Baltimore Co. Bd. Educ., Aigburth Rd., plans by Edw. H. Glidden, 414 Equitable Bldg., Baltimore, brick, block, steel North Catonsville Elementary School, Catonsville, $750,000.

Mass., Bedford—SCHOOL—Town School Bldg., Comn. c/o Supt. Schools, Bedford, plans by Adden, Parker, Clinch & Crimp, 177 State St., Boston, Junior High School. $600,000.

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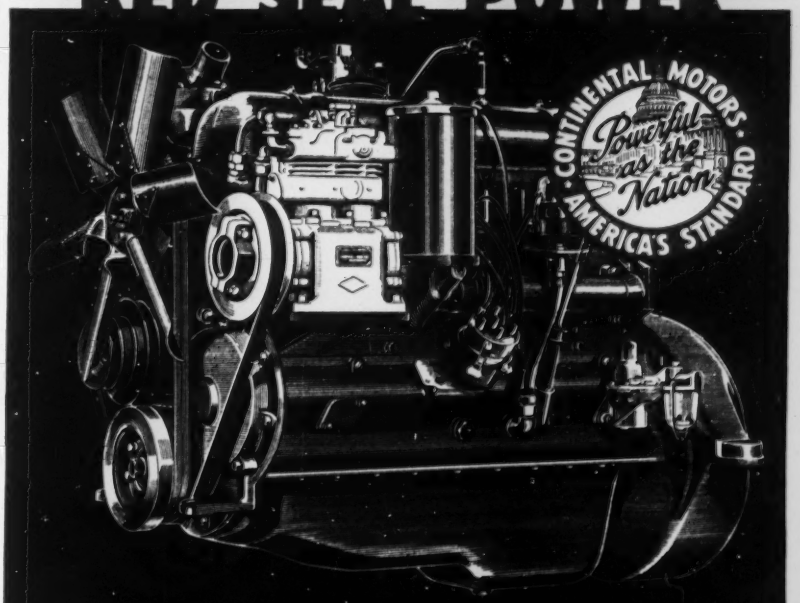

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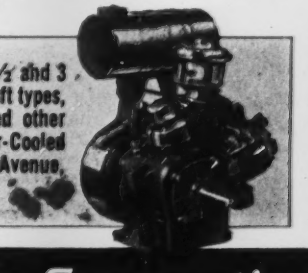

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▲ **Mass., Greenfield**—SCHOOL—Town, School Dpt., F. W. Porter, supt., 125 Federal St., plans by Kilham, Hopkins, Greeley & Brodie, 9 Arlington St., Boston, Senior High School adjacent to Shattuck Park, **$2,500,000.** CD 3/24.

▲ **Mich., Ann Arbor**—HOSPITAL—State, A. N. Langius, dir. State Bldg. Dpt., Lansing, plans by Swanson Associates, West Long Lake Rd., Bloomfield Hills, brick, steel, concrete children's hospital **$2,000,000.** CD 5/13.

Mich., Flint—SCHOOL—City Bd. Educ., Flint voted bonds June 2, 2 story, bsmnt., brick, steel, concrete, Pierson Elementary School, **$650,000.** Eberle M. Smith Assocs., 153 Elizabeth Detroit, archts. CD 5/1.

Mich., Flint—SCHOOL—City, Robert G. Leffler, clk., Flint, plans by MacKenzie, Knuth & Klein, 615 Sill Bldg., brick steel Doyle School addn. **$550,000.**

▲ **Mich., Mount Pleasant**—DORMITORY, etc.—State, A. N. Langius, dir. State Bldg. Dpt., Lansing, plans by Roger Allen & Assocs., 1126 Grand Rapids National Bank Bldg., Grand Rapids, Brick, steel men's dormitory, **$1,250,000;** brick, steel, stone library, **$1,000,000,** Central Michigan College. CD 12/29.

Mich., Mount Pleasant—MUSIC-DRAMATIC ARTS—State, A. N. Langius, State Bldg. Dpt. Lansing, plans by Roger Allen & Assocs., 1126 Grand Rapids Natl. Bank Bldg., Grand Rapids, brick, steel music-dramatic arts, college bldg. Central Michigan College. **$500,000.** CD 12/29.

▲ **Mo., Independence**—POWER PLANT—City, c/o Robert S. Everitt, chn., bond election in August, enlarging power plant, **$1,500,000.** Black & Veatch, 4706 Broadway, Kansas City, Mo., consult. engrs. CD 12/3.

Neb., Hastings—HOSPITAL—State Bd. Control, Lincoln, plans by L. A. Daly Co., Insurance Bldg., Omaha, medical and surgical bldg. at Hastings State Hospital, **$885,000.** CD 4/10.

▲ **N. J., Trenton**—SCHOOLS—Ewing Twp. Bd. Educ. Parkway Ave., plans by Micklewright & Mountford, 72 Ewing St., high school, **$2,000,000;** elementary school, Reed Ave. and Upper Ferry Rd. **$1,000,000.**

N. Y., Tuckahoe—SCHOOL—Bd. Educ., Tuckahoe, plans by Maurice Capobianco, 30 S. Broadway, Yonkers, School No. 31, Central Park Ave. and Tuckahoe Rd. **$450,000.**

▲ **O., Rocky River**—SCHOOL—Rocky River Bd. Educ., bond election Nov. 3, elementary school and existing school imprvs. **$1,000,000.** CD 11/21/49.

Ore., Salem—SERVICE—State Bd. Control, Salem, plans by James L. Payne, Salem, service bldg. for State Finance Dept. **$700,000.**

▲ **Pa., Phila.**—HOME—Dpt. Procurement, City Hall Annex, plans by Gilboy & O'Malley consult engrs. and Alfred Clauss, archt. 1810 Rittenhouse Square, Riverview Home for the Indigent. **$1,000,000.** CD 11/24/44.

▲ **Pa., Pittsburgh**—HIGH SCHOOL—Bd. Educ. of Mt. Lebanon, Washington Rd., plans by Ingham, Boyd & Pratt, 407 Liberty Ave., 1 story, brick, concrete, steel Senior High School Addn. Mt. Lebanon, **$1,800,000.**

S. C., McCormick—SCHOOLS—McCormick Co. Bd. Educ., McCormick, White High School. **$450,000;** Negro High School, **$450,000.**

▲ **Tex., Dallas**—CITY HALL—City Hall, Main and Harwood Sts., plans by Smith & Mills, Mercantile Bank Bldg., city hall, Harwood St. between Main and Commerce Sts. **$2,500,000.** Mark Lemmon, 1210½ Main St., consult. archt. CD 7/5/51.

Tex., Hempstead—COURT HOUSE—Waller Co., Hempstead, plans by H. Voelcker & Assoc., 1202 Dennis St., Houston, court house. **$600,000.**

Wis., Neenah—SCHOOL—Bd. Educ., Neenah, plans by Perkins & Will, 309 W. Jackson Blvd., Chicago, Ill., high school addn. **$500,000.**

COMMERCIAL BUILDINGS

Calif., South Gate—MARKET, etc.—Owner, c/o Gearhart & Holmes, archts., 600 N. Sepulveda Blvd., Los Angeles, 1 and part 2 story, masonry, market and shopping center, **$778,000.**

Calif., Van Nuys—DWELLINGS—Bilt-Rite Homes, 8616 Reseda Blvd., Northridge, 66 frame, stucco dwellings, Glenoaks, Polk and Oro Grande Sts. **$528,000.** Richard T. Moss, 8616 Reseda Blvd., Northridge, engr.

▲ **Ill., Chicago**—APARTMENT—Marshall L. and Paul Holleb, 33 N. LaSalle St., plans by Loewenberg & Loewenberg 115 W. Monroe St., Zone 3, 19 story apartment, 72 suites, Lake Shore Dr. and Wellington Ave. **$2,500,000.**

Ia., Carroll—SCHOOL—St. Thomas High School, Carroll, plans by J. E. Loftus, Omaha National Bank Bldg., Omeha, Neb., school addn. **$700,000.**

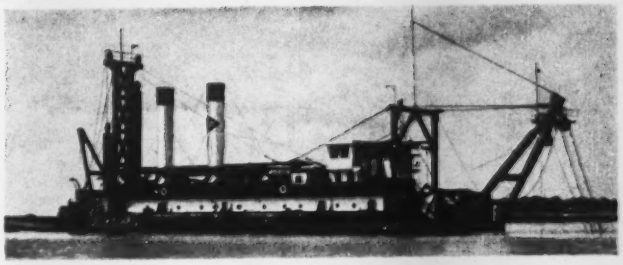
Kan., Hays—HOSPITAL—Hadley Memorial Hospital, Hays, hospital addn. **$827,000.**

▲ **Md., Baltimore**—HOSPITAL—Maryland General Hospital, Howard St., Linden Ave. and Madison St., plans by Jas. R. Edmunds, Jr., 1025 St. Paul St., enlarging brick, steel, rein.-con. hospital. **$1,000,000.**

Mich., Detroit—DORMITORY—University of Detroit, 4001 West McNichols, Detroit, 316-men brick, steel dormitory, College Campus next to Holden Hall, **$980,000.**

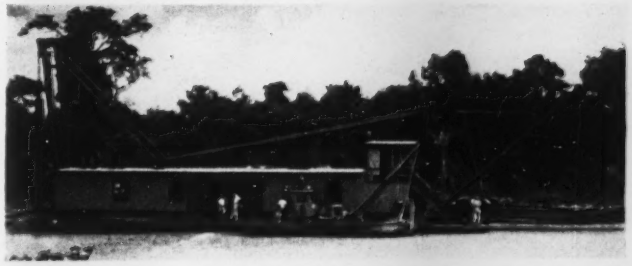
Minn., St. Louis Park—MOTEL—Lilac Lanes Hotel Co., J. O. Louis, St. Louis Park, plans by Brandhorst & Leadholm, 4829 Minnetonka Blvd., Minneapolis, 35-unit inner ring and 69-unit outer ring motel, Belt Line and Excelsior Blvd. **$650,000.**

NO JOB TOO LARGE



Dredge "Peru": 30-inch diameter discharge, cutter-head hydraulic pipe-line dredge which can be towed by ocean-going tugs to any destination in the world. The "Peru" is now working on a 40,000,000 cubic yard job on the Orinoco River, Venezuela, dredging a channel to allow large ocean-going ore carriers to reach the loading terminal 170 miles from the sea.

NO JOB TOO SMALL



Portable cutter-head, hydraulic pipe-line dredges in smaller sizes which may be completely dismantled for transport by ship, railroad or trailer truck. Dredge illustrated a 12-inch diameter discharge and has just completed a 1,200,000 cubic yard job in Surinam, Dutch Guiana, dredging a turning basin for ships 120 miles up the Cottica River, cutting bends and deepening the river channel.

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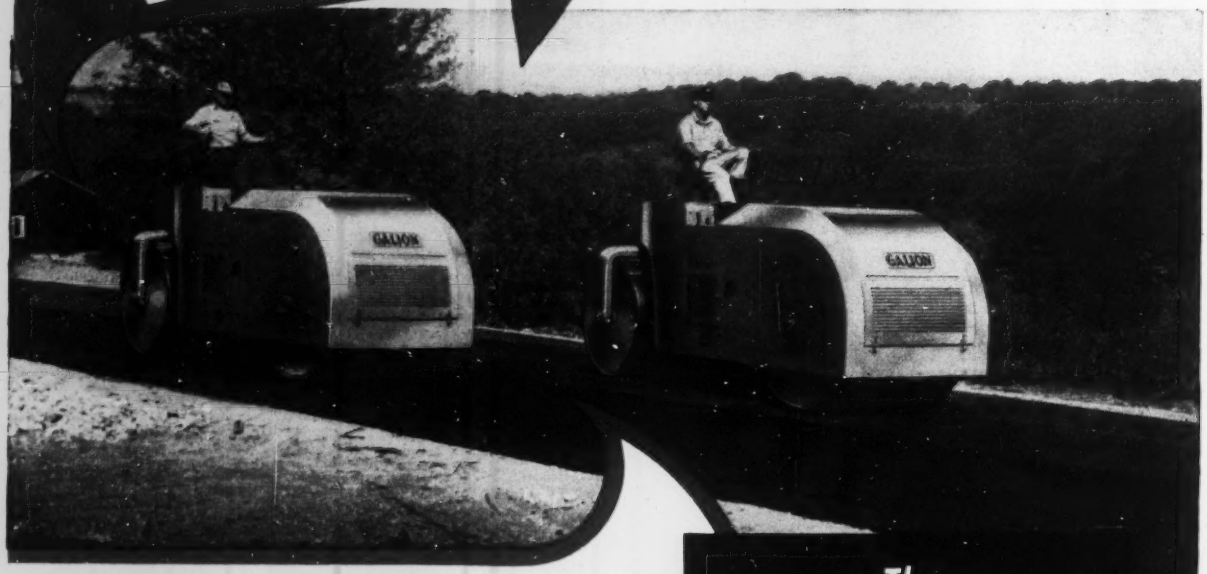

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▲ **Mo., Liberty**—HOUSING—Nile Adams, c/o Legal Reserve Investment Corp., 119 E. 9 St., Kansas City, Blueberry Hill development, incl. 175 residences, 90-acre trace, $3,000,000.

N. H., Manchester—MONASTERY—Sisters of the Precious Blood, 555 Union St., plans by Leo P. Provost, 61 Amherst St., monastery, E. Bridge St. $700,000.

▲ **N. J., New Brunswick**—SHOPPING CENTER—Ralph Biernbaum, c/o William Newmann & Sons, archts., 587 Summit Ave., Jersey City, Middlesex County Shopping Center, on 22-acre tract at Burnet St. Traffic Circle Routes 1 and 18. $3,000,000.

▲ **N. Y., New York**—APARTMENTS—Godfrey Nurse Houses, Inc., 1774 Broadway, Zone 19, plans by S. J. Kessler & Sons, 118 E. 28 St., New York, Zone 16, seven 14 story apartments, 1 each at 10 W. 135 St., $1,570,000; 470 Lenox Ave., $1,494,000; 25 W. 132 St., $1,300,000; 40 W. 135 St., $1,300,000; 45 W. 132 St., $1,300,000; 2186 Fifth Ave., $1,300,000; 35 W. 132 St., $1,300,000.

▲ **O., Columbus**—DWELLINGS—Hughes-Hyatt Realty, Inc., 2655 Ashbury St., multiple-unit dwellings, ranch type singles and four-family apartments in newly-opened Fairway Addn. $2,000,000.

▲ **O., Columbus**—OFFICE and APARTMENT—Tower Properties, Inc., 42 S. 4 St., 12 story, two-bsmnt. levels office and apartment, on 75x187.5 ft. lot, S. 4th and Oak Sts.

▲ **Okla., Oklahoma City**—CHURCH—First Christian Church, Fred Mock, chn. Bd., 1104 N. Robert St., plans by Conner & Pojezny, 1029 N. Walker St., church. $1,250,000.

Okla., Tulsa—HOSPITAL—Hillcrest Memorial Hospital, Bryce Twitty, admin., 1653 E. 12 St., plans by Donald McCormick, 1124 S. Boston St., hospital addn. $500,000.

▲ **Pa., Elkins Park**—SHOPPING CENTER—Owner, c/o Agent Philip Newman, 1325 Walnut St., plans by Victor Gruen, 31 W. 12 St., New York, N. Y. shopping center and parking area, Ogontz and Cheltenham Aves. $15,000,000.

▲ **Pa., Natrona Heights**—SHOPPING CENTER—John P. & Alex Marino, 715 Western Ave., Tarentum, plans by Critchfield & Cozza, 315 Hays Ave., Pittsburgh, 1 story, L-shaped, 150x700 ft., 150x215 ft., steel frame, brick, block shopping center. $1,500,000.

▲ **Pa., Phila.**—APARTMENT—Fredric R. Mann, 1420 Walnut St., apartment, Lincoln Dr. and Johnson St. $2,000,000.

Pa., Pittsburgh—DORMITORY, etc.—St. Francis Academy, Castle Shannon, plans by A. Pyzdrowski, 3410 Melwood St., 2 story, 39x72 ft., brick, block dormitory, 142x124 ft., steel, concrete chapel addn. $500,000.

▲ **Pa., Pittsburgh**—ENGINEERING AND MINES—University of Pittsburgh, Forbes St., plans by Hoffman & Crumpton, Century Bldg., Pittsburgh, 6 story, 80x150 ft., steel, concrete School of Engineering and Mines. $1,000,000.

S. C., Columbia—OFFICE—Security Federal Savings & Loan Assn., 1200 Washington St., plans by Lefaye, Fair, Lefaye & Assoc., 1221 Sumter St., office. $750,000.

Tex., Dallas—DWELLINGS—Transtex Constr. Co., c/o J. G. Farmer, 8619 Westglen Dr., 30 brick dwellings, concrete slab fdn., $350,000; 25 masonry dwellings, air-conditioning, $345,000, in portion Westglen Park.

Tex., Dallas—HOUSING—New Homes Construction Co., 10374 Fern Dr., plans by Geo. Marble, c/o owner, 38 brick veneer dwellings, $300,000; 46 brick veneer dwellings, $345,000; an extension of Housley Dr.

Tex., Port Lavaca—CHURCH—First Baptist Church Congregation, Port Lavaca, plans by Ben E. Christian, 921 Ocean Dr., Corpus Christi, 60,000 sq. ft. brick, tile masonry, structural steel church. $600,000.

Va., Richmond—OFFICE—Lawyers Title Insurance Corp., 1111 E. Main St., office, $750,000.

INDUSTRIAL BUILDINGS

Ill., Chicago—WAREHOUSE—Wine Corp. of America, 3737 S. Sacramento Ave. Plans by M. O. Nathan, 343 S. Dearborn St., Zone 4, wine warehouse, $500,000.

▲ **Ill., Decatur**—FACTORY—Caterpillar Tractor Co., 600 W. Washington St., East Peoria, 700,000 sq. ft. factory. $7,000,000.

▲ **Ill., Urbana**—FACTORY—The Magnavox Co., Bueter Rd., Fort Wayne, Ind., factory. $1,000,000.

Ind., Whiting—WAREHOUSE—Standard Oil Co. of Indiana, 910 S. Michigan Ave., Chicago, Zone 5, Ill., plans by Lundstrom & Skubic, 53 W. Jackson Blvd., Chicago, 4, Ill., 120,000 sq. ft. steel frame warehouse. $700,000.

▲ **Kan., Kansas City**—PROCESSING CENTER—Safeway Stores, Inc., c/o M. V. Witbech, div. mgr., Argyle Bldg., Kansas City, addnl. buildings at food processing center, 12, 14 and Argentine Blvd. $2,500,000.

▲**Mich., Flint**—PLANT—Chevrolet Div. General Motors Corp., T. H. Keating, gen. mgr., General Motors Bldg., Detroit, plans by Argonaut Realty Div., 304 General Motors Bldg., Detroit, 600,000 sq. ft. automobile frame and stamping plant. $6,000,000. CD 7/2.

▲ **Mo., Mexico**—PLANT—Lange Bros., Inc., 1 Angica St., St. Louis, fertilizing plant. $8,000,000.

Neb., Lincoln—PLANT—Hastings Plastic Co., R. W. Kerr, pres., Hastings, mfg. plant, 56 and Benton Sts. $100,000.

▲ **N. J., Pedricktown**—OIL REFINERY—Pan American Refining Co., 122 E. 42 St., New York, N. Y., oil refinery. $25,000,000. Site not selected.

N. J., Pitman—PLANT—Struthers & Dunn, Inc., 160 N. 13 St., Phila., Pa., mfg. plant. $300,000. Charles P. Caulfield, Pitman, consult. engr.

N. Y., Brooklyn—WAREHOUSE, etc.—Key Food Stores Co-op., Inc., 225 47 St., plans by Louis A. Bellini, 44 Court St., Zone 2, 1 story grocery warehouse and offices, 593-665 East 56 St. $450,000.

N. Y., New York—GARAGE—Roto Garages, Inc., Chrysler Bldg., Zone 17, plans by Serge P. Petroff, 285 Madison Ave., Zone 17, garage, 207 W. 56 St. $600,000.

N. C., Raleigh—GARAGE—Raleigh Merchants Bureau, Raleigh Bldg. and Loan Bldg., auto parking garage. $600,000.

O., Toledo—WAREHOUSE—D. H. Overmyer Warehouse Co., 217 Cherry St., warehouse on Maumee River in East Toledo, with 100,000 sq. ft. facilities for rail, truck and shipside loading and unloading. $750,000.

Tex., Dallas—PLANT—Merla Tool Corp., 9223 Burrus St., plant expansion, Abernathy Rd. $500,000.

Tex., Fort Worth—PLANTS—Texas Industries, Inc., c/o Ralph B. Rogers, Kirby Bldg., Dallas, sand and gravel plant imprvs. and expansion for Texas Dry Concrete Co., $190,000; sand and gravel plant imprvs. and expansion for Fort Worth Sand & Gravel Co., $225,000; imprv. gravel and sand plant, $200,000; imprvs. and expansion sand and gravel plant for Thomas Gravel Co., $175,000; sand and gravel plant imprvs. for B & R Transportation Co., $150,000.

▲ **W. Va., St. Mary's**—PLANT—Union Carbide & Carbon Corp., Linde Air Products Div., 30 E. 42 St., New York, 17, N. Y., silcons plant at Long Beach, near here. $13,000,000.

UNCLASSIFIED

▲ **Texas**—COMPRESSOR STATIONS — Permian Basin Pipe Line Co., Midland, enlarging permanent type compressor stations, 3,960 added HP, Plymouth, $325,000; 10,560 h.p., near Andrews, Andrews Co., $465,000; 22,940 h.p. near Seminole, Gaines Co. $750,000.

▲ **Wash., Pasco**—RAILROAD YARD—Northern Pacific Ry. Co., H. R. Peterson, ch. engr., 176 E. 5 St., St. Paul, Minn. expanding railroad yard, $7,000,000.

▲ **Wash., Spokane**—NEW YARDS, etc.—Union Pacific R. R., W. C. Perkins, ch. engr., 1416 Dodge St., Omaha, Neb., constr. new yards, incl. enginehouse, storehouse, powerhouse, sand storage, drying and handling facilities, water tank and servicing installation, diesel and black fuel oil storage and servicing facilities, track scale repair track shed and shops, paving, air, water, sewer, steam and electric power lines, rein.-con. and about 58,700 ft. addnl. trackage in East Spokane.

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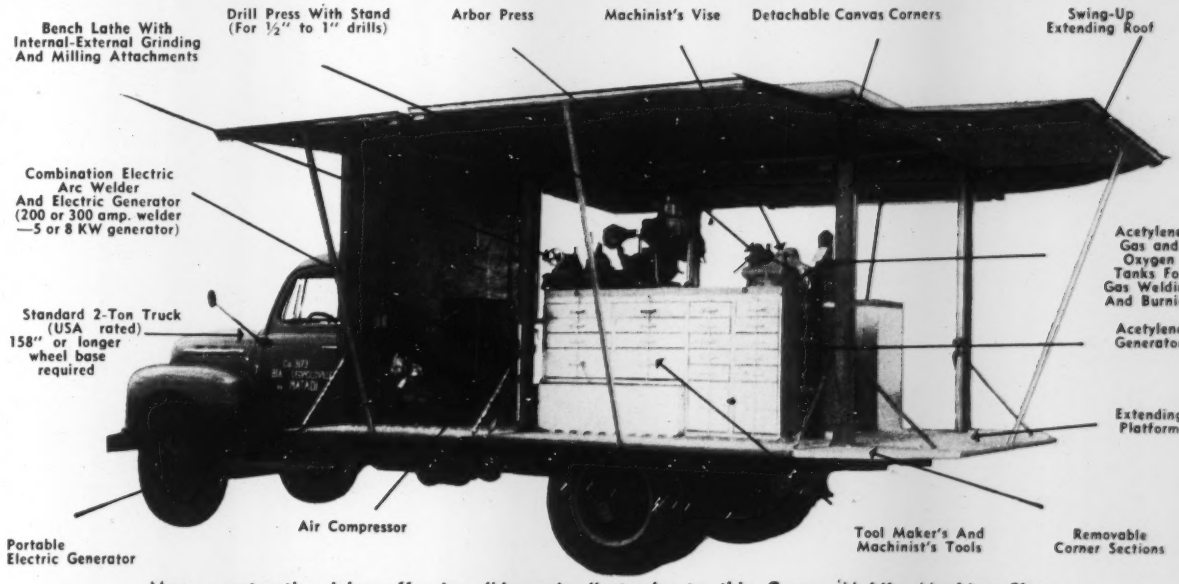
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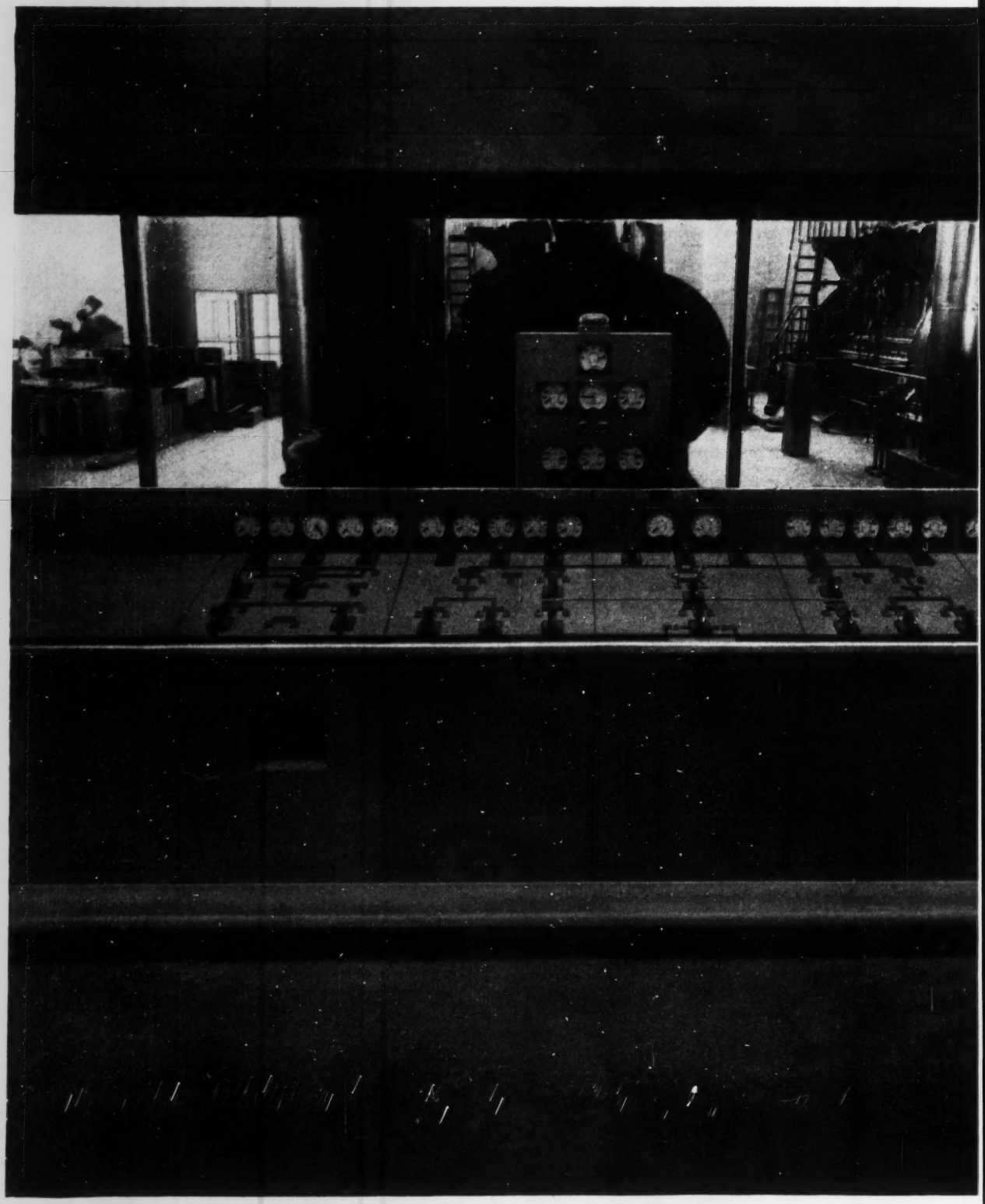
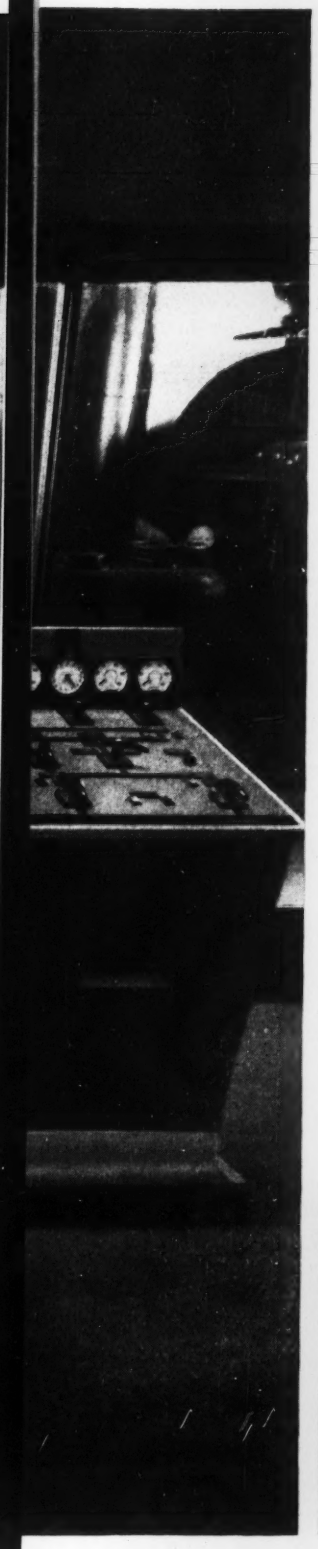


New Hunts Point Sewage Control Plant, Bronx, New York, has a design capacity of 120 million gallons per day (mgd). Future plant expansion will ultimately increase capacity to 150 mgd. J. Livingston & Co., New York City, electrical contractor.



Sound planning and unit equipment assure reliable power at Hunts Point

Service continuity is extremely important to the new 120-mgd Hunts Point Sewage Disposal Works—significant step in the City of New York's pollution control program. Shutdowns would affect a tributary population of 770,000 in a 15,613 acre area.

Based on a careful study during the blueprint stages, engineers for the Department of Public Works, City of New York, designed a duplex electrical distribution system. It assures reliable service by providing dual feeders, switching capacity and transformers, plus electrical tie breakers.

Supplementary power is available from two by-product gas engine generators—each rated 875 kva. These can also be operated as blower drive motors.

Westinghouse power, switching and control equipment play a vital part in the duplex system. Co-ordinated specifically for Hunts Point, this completely unitized line installed easily. It simplifies maintenance due to accessibility of breakers and controls. It assures easy, economical expansion because of its inherent flexibility.

Hunts Point is another instance of Westinghouse participation in sewage control projects—ranging from special engineering assistance to supplying a complete line of electrical distribution equipment.

Call your nearest Westinghouse office for examples in your own area. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-94962

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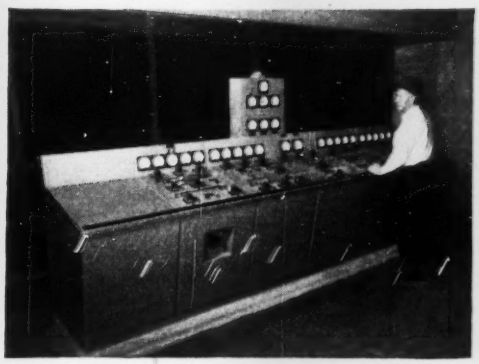
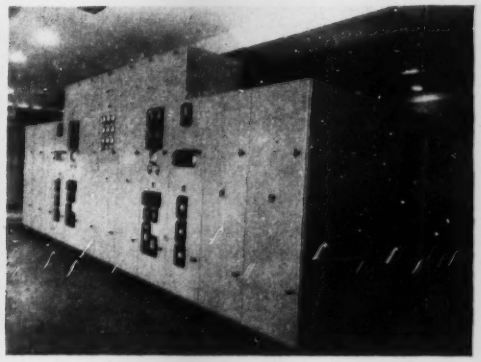


Westinghouse Main Control Benchboard provides finger-tip control of virtually all plant operations. From it, utility and plant power can be controlled through remote switching of feeders and transformers in both systems.



Westinghouse Indoor Metal-Clad Switchgear, 4160 volts, is located back to back with similar switchgear which controls utility power supply. Factory assembled and tested, this compact unit installed easily and saved building space.

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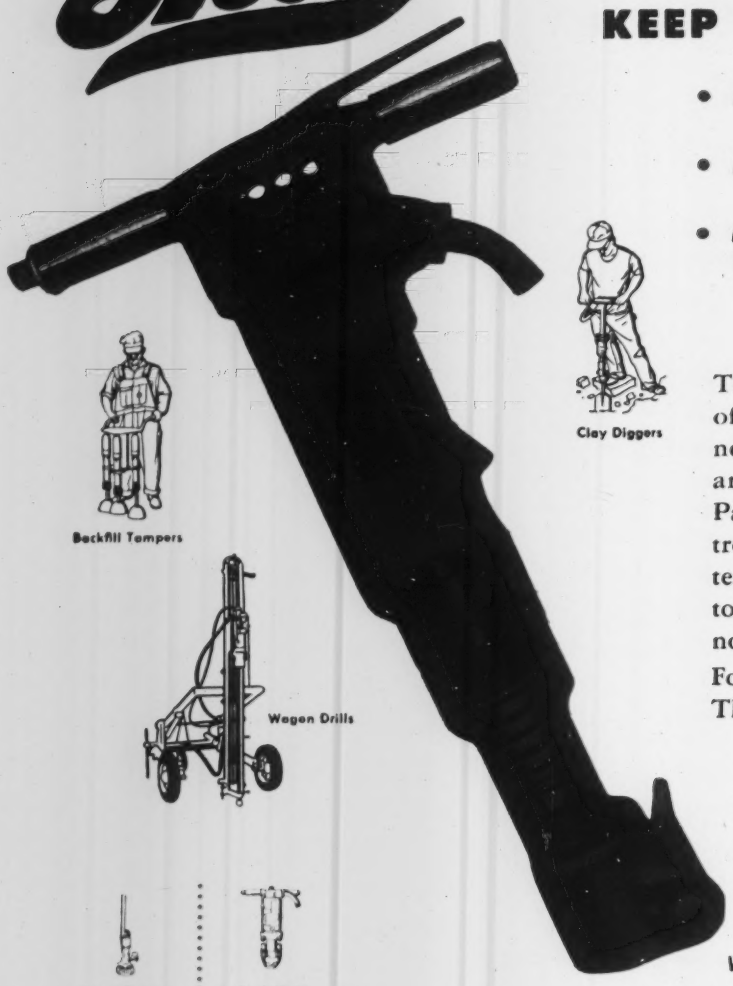

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UNIT PRICES

Highway & structures, Ohio

A $275,272 contract for highway and bridge work has been awarded by the Ohio State Highway Department, Max R. Farley, Marietta division engineer. The award was made to W. J. Elliott, McConnelsville, Ohio, lowest of seven bidders.

Work includes grading, draining and paving 0.783 miles of highway. The pavement is to be 22-ft and 28-ft wide. Also included is construction of a three-span, 20-ft, continuous steel beam, concrete deck bridge having a total length of 221 ft.

This project provides for the elimination of a dangerous alignment approaching the present Hocking River bridge.

The project started July 1 and is expected to be completed by the end of August, 1954. Wage rates cover the following range: skilled labor, $2.10 to $2.80 per hr; semi-skilled labor, $1.60 to $2.45 per hr; and common labor, $1.10 per hr.

Bidders include:

1C W. J. Elliott, McConnelsville, Ohio	$275,272
2 Harley E. Calvin & Co., Marietta, Ohio	319,364
7 George A. Stein Contr. Co., Chillicothe, Ohio.	409,789

Bids: 6-2-53 Items	Unit	Quantity	Unit Prices 1 C	2
Roadway				
Roadway excavation	cy	18,255	$0.55	$0.70
Borrow	cy	26,376	0.70	0.70
Remove for reuse, existing bit wearing course	sy	4,914	0.50	0.20
Rem & store existing brick wearing course	sy	4,104	0.50	0.25
Rem & dispose of existing curb	lf	400	0.50	0.25
Water	mgal	312	5.00	7.00
Rem & dispose of existing guard rail	lf	102	0.20	0.50
4" conc sidewalk	sf	10,450	0.55	0.70
6"	sf	860	0.75	0.90
Guard rail, flexible steel plate tensons type, std str or stl beam type (shallow)	lf	2,224	2.20	2.50
Side approach, mail box turnouts & berm mat	cy	135	2.00	4.00
for surfacing tem traffic lane	cy	3,000	2.00	3.00
Calcium chloride, furn & applied	t	30	60.00	50.00
Seeding & prot "type A"	sy	35,892	0.10	0.12
Commercial fertilizer	t	3	100.00	100.00
Agr ground limestone	t	16	20.00	20.00
Loading, hauling, placing & rolling salv bit pvmnt	cy	135	1.00	1.50
Compacted subgrade	sy	11,415	0.10	0.25
Drainage				
Exc for structures	cy	114	5.00	7.00
Conc for struct (class E)	cy	5	50.00	65.00
Pipe rem, 6" to 18"	lf	541	0.50	1.00
Rem existing struct	ls	1	500.00	100.00
15" std-str reinf conc culv pipe for rdwy culv	lf	185	4.00	4.00
18"	lf	226	5.00	5.00
Plain corr met pipe for driveways, 12"	lf	24	3.00	3.00
15"	lf	28	3.50	3.50
18" std-str plain CC pipe for storm sewers	lf	90	3.00	4.00
6" extra quality drain tile for underdrains	lf	610	1.00	2.25
6" std-str plain CC pipe outlets for underdrains	lf	24	1.00	2.50
6" pipe specials for underdrains	ea	2	5.00	3.00
Std no. 3 catch basins	ea	3	300.00	400.00
Riprap, type „A"	sy	9	10.00	10.00
Catch basins abandoned	ea	2	50.00	150.00

Bids: 6-2-53 Items	Unit	Quantity	Unit Prices 1 C	2
Pavement				
Crushed aggr base	cy	322	5.00	7.00
Subbase, grading C or D	cy	1,705	3.00	3.00
Bituminous prime coat	gal	363	0.40	0.30
Road mix bit material	gal	1,416	0.40	0.20
Seal coat bit material	gal	322	0.40	0.30
Aggregate for road mix	cy	73	6.00	5.00
Aggregate for choke	cy	5	6.00	5.00
Aggregate for seal coat	cy	8	6.00	5.00
Asph conc surface crse	cy	35	50.00	30.00
6" PCC pavement	sy	39	5.00	5.00
9" reinf PCC pavement	sy	9,522	6.00	6.50
Bituminous tack coat	gal	10	0.40	0.50
Reinf conc approach slabs	sy	97	12.00	12.00
Std type 2-A conc curb	lf	2,542	1.00	0.50
Structure (over 20 ft span)				
Cofferdams, cribs & sheeting	ls	1	12,000	35,00
Uncl excavation	cy	481	5.00	7.00
Cl "C" conc superstructure	cy	293	55.00	65.00
Cl "C" conc abutments	cy	111	50.00	60.00
Cl "C" conc pier caps & columns	cy	78	60.00	75.00
Cl "E" conc pier fcotings	cy	90	50.00	55.00
Type "C" waterproofing	sy	690	0.25	1.50
Reinf steel	lb	100,752	0.11	0.11
Structural steel	lb	284,900	0.15	0.15
Field painting of str stl	lb	284,900	0.01	0.01
Rail (stl with conc end posts)	lf	453	15.00	20.00
First test pile (timber or concrete)	ls	1	500.00	1,000
Timber pile, untreated	lf	1,680	2.00	3.00
12" cast-in-place reinf conc piling	lf	990	6.00	7.00
Steel pile points	ea	78	3.50	5.00
Remove existing struct	ls	1	5,000	5,000
Subdrains for wearing surface course	lf	222	0.50	2.00
Type "A" riprap	sy	250	10.00	10.00
Concrete gutter	lf	28	5.00	5.00
Asph conc surface course, type A or C	cy	48	50.00	30.00
Premium on industrial insurance	ls	1	5,000	2,000
Maintain traffic	ls	1	5,000	3,500

Water works, South Carolina

Eight contractors bid on a $80,364 water works job done for the town of Landrum, South Carolina. The contract was awarded to the C. Y. Thomason Co., Greenwood, South Carolina, the low bidder. The Thomason bid was 32% below the high bid by A. H. Guion Co., and 12% below Lee Const. Co.'s second low bid. The Harwood Beebe Co., Spartansburg, S. C. is the engineer.

Work consists of construction of a half-million gallon, water filtration plant with a six-hour retention settling basin and wash water pump. Also included is the building of two access roads with bituminous surfacing.

Bidders include:

1C C. Y. Thomason Co., Greenwood, S. C.	$80,364
2 Lee Construction Co., Charlotte, N. C.	91,372
8 A. H. Guion Co., Charlotte, N. C.	119,000

Bids: 2-5-53 Items	Unit	Quantity	Unit Prices 1 C	2
Common excavation	cy	2,320	$1.60	$1.30
Rock excavation	cy	300	3.00	2.00
Top soil	cy	1,230	2.00	1.10
Two access roads, except surfacing	ls	1	800.00	3,180
Bituminous surfacing	sy	5,500	0.75	1.10
Additional fndn conc	cy	10	40.00	40.00
Filter plant structure	ls	1	36,470	41,212
Plumbing & heating	ls	1	750.00	1,595
Filter pipe & equipment	ls	1	16,847	16,490
Wash water pump & pipirg	ls	1	2,100	2,170
Domestic water system	ls	1	375.00	387.00
Laboratory furn & equip	ls	1	1,500	1,466
Yard piping	ls	1	4,300	7,704
Electrical work at filter plant	ls	1	3,125	3,094
Fence around plant	ls	1	2,500	2,655

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HARTFORD 15, CONNECTICUT

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Mondelci & Benvenuti,** 16 Elm St., New London, Conn. LB **$2,239,999,** CONTINUED TREATMENT bldg., State Hospital Proj. B/A-K-81. NORWICH, CONN. State P. Wks. Comn. State Office Bldg., Hartford, Conn. Bids July 10. CD 6/23

MIDDLE ATLANTIC

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Merritt-Chapman & Scott Corp.,** 260 Madison Ave., New York 16, N. Y., LB. **$4,726,052,** est. $5,000,000. Henry C. Schlaich Memorial Bridge between Long Beach and Island Park, MINEOLA, N. Y. Bd. Supervs., Nassau Co., Old Court House, Mineola, N. Y. Bids July 21. CD 7/16.

▲ **Frank Mascali & Sons, Inc.,** 120 St. and 31 Ave., Flushing, N. Y., LB **$1,590,011,** vehicular overpass, incl. grading, utilities, paving, landscaping Franklin D. Roosevelt Dr. between 92 and 99 Sts., Manhattan Boro. Contr. No. 96A. NEW YORK, N. Y. Triborough Bridge & Tunnel Auth., Adminstration Bldg., Randall's Island, New York 35, N. Y. Bids July 22. CD 7/13.

▲ **PENNSYLVANIA**—State Hy. and Bridge Auth., 506 N. Office Bldg., Harrisburg,
C. J. Langenfelder & Son, Inc., 8427 Pulaski Hy., Baltimore 24, Md., LB. **$2,475,870.** 10,994 ft. divided hy. rein.-con. pavement 24 ft. on each side of divisor, 3 steel plate girder and one I-beam bridge, T.R. U.S. 1, Bucks Co. Bids July 17. CD 6/11.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **East River Housing Corp.,** 550 Grand St., New York, N. Y. Own Forces. **$17,800,000.** Corlears Hook HOUSING Project, Lewis St., Franklin D. Roosevelt Dr. and Williamsburg Bridge, NEW YORK, N. Y. George W. Springsteen, 92 Liberty St., New York, N. Y., archt.

▲ **Turner Constr. Co.,** 161 E. 42 St., New York, N. Y. CA **$45,000,000.** 42-story OFFICE bldg., Lexington and Third Aves., 41st and 42nd Sts., NEW YORK, N. Y., Galbreath Corp., 150 E. 43 St., New York, N. Y. Harrison & Abramovitz, 630 Fifth Ave., New York, N. Y., archts. John B. Peterkin, 36 W. 44 St., New York, N. Y., assoc. archt.

SOUTH

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ † **Blake Constr. Co., Inc.,** 33 "E" St. S. W., Wash., D. C., CA, **$4,178,000** 5 missile assembly bldgs., and vertical launching facilities, Patrick Air Force Base, COCOA, FLA., U. S. Eng., P. O. Box 4970, Jacksonville, Fla. Bids July 3. CD 7/20, under LB.

▲ **McIlvaine & Abel Co.,** Ft. Thorn St., Wilmington, Del. CA **$1,396,837,** Div. A and B.;
A. H. Guion & Co., Wilkinson Bldg., Charlotte, N. C., CA **$883,501,** Div. C;
W. L. Hailey & Co., 314 42 Ave. N., Nashville, Tenn. CA **$557,513,** Div. D, intercepting sewers;
James McHugh & Sons, 6449 S. Park Ave., Chicago 37, Ill., CA **$1,805,064,** Div. F (structures); for Third Creek Treatment Plant, Grand total $4,642,915. KNOXVILLE, TENN. City, City Hall, Knoxville, Tenn. Bids July 1. CD 7/15 under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ † **Blount Bros. Constr. Co.,** P. O. Box 1144, Montgomery, Ala., CA **$2,215,962,** 1-Bldg. of the DE-CONTAMINATION and RECOVERY BLDG., OAK RIDGE, TENN. U. S. Atomic Energy Comn., Oak Ridge, Tenn. Bids July 2. CD 7/14, under LB.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲ **O., Cleveland**—TERMINAL—B.A. 9/3—City, City Hall Zone 14, main passenger terminal bldg. and north concourse at Cleveland Hopkins Airport, incl. appurtenant structures, adjacent paving and interim access roadways. $3,000,000. Plans deposit $100. Outcalt, Guenther & Assoc., 13124 Shaker Square, archts. CD 11/7/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **H. D. Tousley & Co. Inc.,** 925 E. St. Clair St., Indianapolis Zone 4, Ind., and **Ralph Green,** Oaktown, Ind., CA, **$1,678,929,** 6,900,000 gal. capacity reservoir, dam across Cicero Creek, near Noblesville INDIANAPOLIS, IND. Indianapolis Water Co. Monument Circle, Indianapolis, 4, Ind. Lewis S. Finch, c/o owner, engr. Awarded July 13. CD 8/16/49.

▲ **R. L. Wirtz, Inc.,** 720 E. Broad St., Columbus, O. CA **$2,650,000.** SHOPPING CENTER, MARION, O. W. Lyman Case Co., 150 E. Broad St., Columbus, O.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Ragner Benson, Inc.,** 4744 W. Rice St., Chicago 51, Ill., CA **$7,000,000.** general constr. superstructure for GENERATING STATION, LEMONT, ILL. Public Service Co. of Northern Illinois, 72 W. Adams St., Chicago 3, Ill. Bids Apr. 3, awarded July 13. CD 3/17.

▲ **Schostak Bros & Co.,** 3415 Cadillac Tower, Detroit, Mich., CA. **$6,500,000.** 400,000 sq. ft. SHOPPING CENTER, 21 acre site, Fort, New York Sts. and Riverbank Ave., parking facilities, LINCOLN PARK, MICH. Lincoln Park Plaza, Fort St., Lincoln Park, Mich. CD 6/10.

WEST OF MISSISSIPPI

BIDS ASKED—BUILDINGS

▲ **Mo., Kansas City**—SCHOOL—B.A. 8/6—School Dist. of Kansas City, Library Bldg., Kansas City, new secondary school, Arlington and Truman Rd. $2,500,000. Keene & Simpson, 15 W. 10 St., archts. CD 7/9 under LB.

▲ **Minn., Minneapolis**—OFFICE—B.A. 8/19—At office Magney, Tusler & Setter, archts., 202 Foshay Tower, office bldg., approx. 280,000 sq. ft., 120x450 ft. 10-story tower, 8-story north wing, 4-story south wing, Wayzara Blvd. and France Ave. for Prudential Insurance Co. of America, C. M. Shanks, pres. 763 Broad St., Newark, N. J. $6,000,000. CD 11/5.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **D. C. Bass & Sons Constr. Co.,** Bass Bldg., Enid, Okla. LB **$1,333,777,** general constr.;
Woodhull Plumbing & Heating Co., Manhattan, Kan., LB **$608,803,** mech. for HOSPITAL, FORT SCOTT, KAN. Mercy Hospital, Fort Scott, Kan. Bids July 8. CD 6/30.

▲ **Spencer Chemical Co. of Texas,** c/o Kenneth Spencer, Orange, Tex. Owner Builds. **$22,000,000,** chemical PLANT: $350,000, warehousing-storage; $200,000, plant site grading, excavating for chemical plant fdn.; $75,000, general drainage; $65,000, sanitary sewers; $41,000, water sys. Grand total $22,731,000. ORANGE, TEX. CD 4/28.

▲ **Gulf Oil Corp.,** Port Arthur, Tex. cancelled bids to have been opened, 2nd ethylene PLANT; $13,500,000; warehousing-storage, $200,000; water sys., $45,000. PORT ARTHUR, TEX. CD 5/22.

FAR WEST

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Detweiler & Detweiler, Inc.,** Box 870, Twin Falls, Idaho, LB **$1,299,041.** est. $1,416,830, 1 story and mezzanine 61x103 ft. steel frame central heating plant, at Mountain Home Air Force Base, Inv. 53-61, MOUNTAIN HOME, IDAHO. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids July 16. CD 7/9.

▲† **Osberg Constr. Co.,** 1132 N. 128 St., Seattle, Wash. CA **$1,383,097.** est. $1,384,870, Schedule 1, earthwork, pipe lines, structures for Area P-9 laterals, laterals PE-55 to PE-66, inclusive, sublaterals and wasteways, Potholes East Canal laterals, Columbia Basin Proj Spec. DC 3972. WASHINGTON. Bureau Reclamation, Dpt. Interior, Ephrata, Wash. Bids July 7, awarded July 16. CD 7/16, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Dinwiddie Constr. Co.,** Crocker Bldg., San Francisco, Calif., CA **$2,000,000.** Chewing gum FACTORY on Main St. and West Cliff Dr., SANTA CRUZ, CALIF. Wm. Wrigley Jr. Co., 410 N. Michigan Ave., Chicago, Ill. Awarded July 17. CD 11/20/51, under LB.

CANADA

BUILDINGS

LOW BIDS AND CONTRACTS

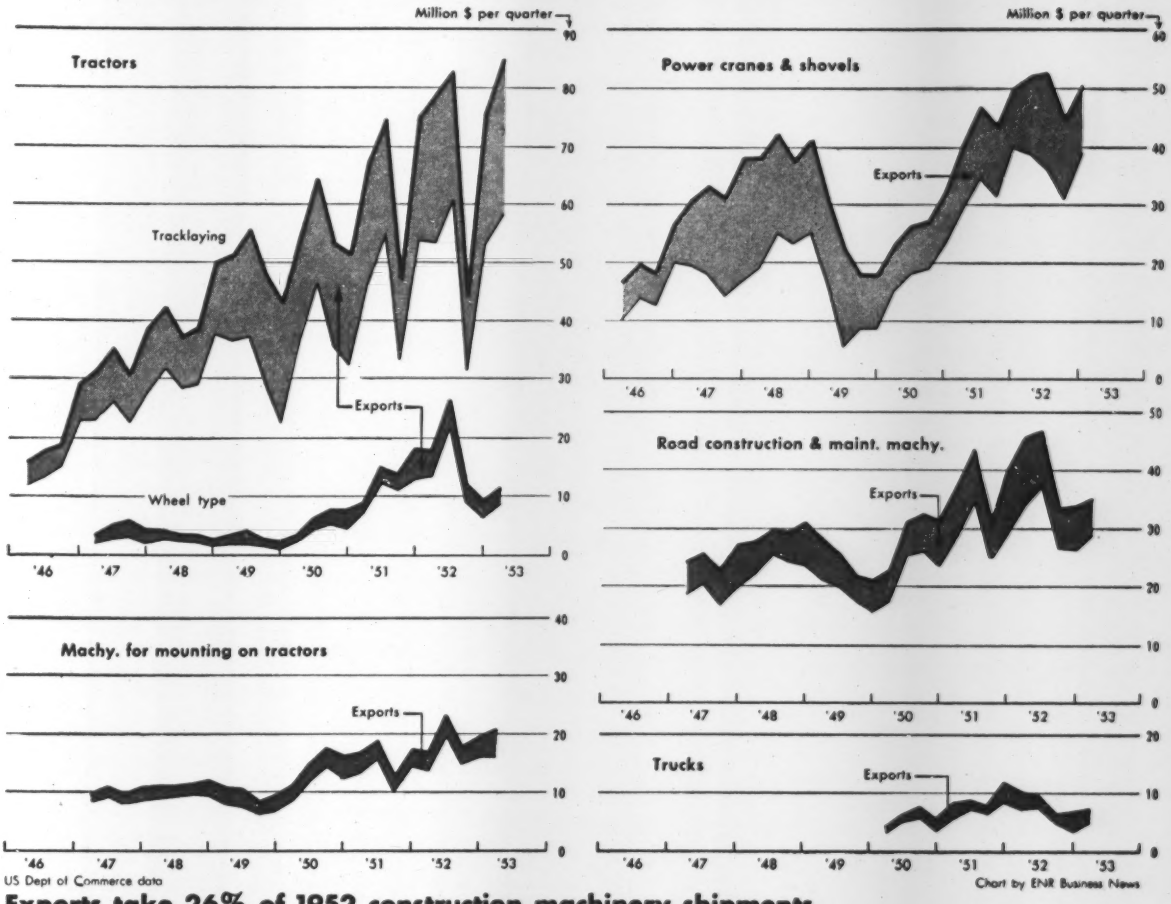
▲ **Northern Constr. Co. and J. W. Stewart Ltd.,** 1304 Hornby Ave., Vancouver, B. C., CA, **$2,899,750** Customs OFFICE bldg., VANCOUVER, B. C. Dpt. Island Revenue, Hunter Bldg., Ottawa, Ont. Bids July 15. L. S. Wells, 1110 W. Georgia St., Vancouver, B. C., archt. CD 6/15.

AMERICANS ABROAD

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Merritt-Chapman & Scott Corp. of India,** 260 Madison Ave., New York 16, N. Y. and **The Hindustan Constr. Co. Ltd.,** Bombay, India, CA. Approx. **$4,000,000.** approx. 50 mi. 8- to 24-in. pipe line to provide network of 7 lines between marine terminal piers off Butchers Island, approx. 2½ mi. offshore, and two refineries now being built on the outskirts of Bombay, INDIA. Bombay Port Trust, Bombay, India.



Exports take 26% of 1952 construction machinery shipments

Materials, machine exports top $1 billion for 1952

Foreign buyers of construction items account for machinery purchases, large share of materials

More than $1 billion worth of American construction machinery and materials was exported from the United States in 1952. That represents 15.8% of the U. S. production of these items.

The total of $400.4 million worth of construction machinery alone (including oil drilling) represents 26% of all factory shipments by manufacturers. More specifically, exports alone accounted for 30% of the dollar value of off-highway trucks that were shipped; 29% of dollar value of tracklaying tractors.

And in addition, U. S. manufacturers shipped an estimated $50 million worth of parts for their machines during the year.

These figures, gathered by ENR from many sources (including the Council for Technological Advancement and the U. S. Department of Commerce) emphasize the increasing importance of the export market for American manufacturers. Perhaps even more importantly, they show the deep penetration that has been made throughout the world by one phase of the U. S. construction industry—even to areas where all work is being done by nationals.

• **Where to?**—Not unexpectedly, the biggest percentage of exported machinery has moved to Latin America—the area that has long offered some of the greatest opportunities for development of natural resources. A total of 32.3% of all machinery exports goes south of the border.

But Europe—which offers (outside of military work) very little opportunity for U. S. construction men—ranks second in imports of machinery, at 15.5%. Asia imported 12.1% in 1952, and other areas (Africa, Australia, etc.) imported 14.9%. Northern North America—chiefly Canada, imported 25.2%.

A somewhat similar pattern—but much harder to pin down to percentage figures—would appear to apply to construction materials shipments.

And the large area breakdowns aren't a complete picture. The fact is that—except for the Iron Curtain area—there is almost no inhabited spot on the earth where some kind of

American equipment or machinery isn't at work or being installed.

It is clear that at least half of the material and equipment is being bought by foreign agencies, both public and private. The Mutual Security Agency, for instance, has been lending at the rate of about $50 million a year to foreign governments and agencies for construction machinery purchases; much of other American funds loaned or granted to foreign governments also has gone for such purchases.

It is extremely difficult to break down the total exports to determine how much was bought by U. S. contractors for shipment and use overseas. But one military job alone involved expenditure of about $20 million for machinery, so that such purchases may well account for the remaining half of the total export business.

• **What went?**—What was shipped abroad is easier to determine. The Department of Commerce lists it this way for 1952:

Wood and wood products, $68.2 million worth.

Wallboard, building paper, insulation and related products (including asbestos, gypsum), $11.8 million.

Stone, cement and lime, $14 million.

Glass, $7 million.

Structural clay products, $3.6 million.

Steel mill products, $172.9 million.

Steel fabricated products, including buildings, wire mesh, wire rope, $91.4 million.

Pipe fittings, valves, and plumbing supplies and fixtures, $78 million.

Non-ferrous metals, $6 million.

Hardware, $40.3 million.

Construction machinery and parts (including oil drillings) $446.4 million.

Installed equipment, $68.3 million.

• **Parts tell the story**—Perhaps a better picture of what's happening to the U. S.-made equipment and materials can be gained from the detailed figures prepared by the Census Bureau on exports.

For instance, biggest 1952 exports of tracklaying tractors went to Canada—which took $7.7 million worth. Brazil was second in line, with purchases of $2 million. France bought $1 million worth; Venezuela, $975,959; the Union of South Africa, $834,845; Mexico, $846,964; Colombia, $595,844; the United Kingdom, $591,341.

But although Canada also led in purchases of parts (with $1.7 million); the United Kingdom was second, with $358,857. Venezuela bought $281,990; Brazil, $213,421; India, $198,722; the Union of South Africa, $159,693; Colombia, $157,648; Liberia, $146,475.

Biggest exports of wheel-type tractors ($2 million) also went to Canada. But biggest buyer of parts for wheel-type tractors was Iraq, which bought $605,945 worth.

Just how deep the penetration has

CONSTRUCTION TRENDS

Equipment and materials make up a large part of the brightening picture for world improvement—and the economic stability of the United States

American construction equipment and materials—which last year accounted for 8% of our total exports—are important aids to nations that are seeking to raise their living standards through economic development.

The problem in many overseas countries—and this applies with special force to the underdeveloped areas—is not the absence of factories to mass produce automobiles. Rather it's the absence of the basic services so necessary to sustain even the smallest type of manufacturing industry. In many parts of Latin America, in the Middle East, in southeast Asia, no economic progress is possible until a dependable food supply is assured, through irrigation and farming know-how. After that can come water supply, and a decent system of transportation—including roads, bridges, piers, railroad lines—is installed. A basic communications system must exist. Transmission lines for electric power are vital if any real manufacturing activity is to be set up. A somewhat advanced need—though it's taken for granted and considered basic here—is a sewerage system.

Once these basic services are available, it's possible to go ahead and build the plants and warehouses needed for manufacturing industry. So you can see that construction equipment and materials are of crucial importance long before an underdeveloped country gets around to building factories.

Construction exports are also of great importance for the U. S. economy. Producers of mining and construction equipment last year sent 15% of their factory shipments to overseas buyers. If—for any reason—world trade were to collapse, these producers would find it difficult to maintain high-level output. As a matter of fact, high and expanding exports of construction equipment and materials can serve as a partial offset against any pause in construction activity in this country.

• **Outlook is bright**—What is the outlook for U. S. exports of construction materials and equipment? It's bright. If foreign demand was the only consideration, it would be glittering. But there's the problem of dollar exchange.

The need and desire to step up purchases of U. S. construction equipment is intense in all underdeveloped countries. When they allocate their limited supplies of dollar exchange, construction imports are always given a very high priority. But what about the payments problem?

It's plain that world trade has been propped up by the U. S. foreign aid program, which has averaged about $5 billion a year. It's also clear that both Congress and the American people are of a mind to terminate—in the very near future—this huge program. The aid was given to put overseas nations on their feet. It was never intended to be a permanent policy. But we do know that overseas nations still have trouble balancing their accounts—even though the aid program has not yet been halted. Clearly, the task of expending the level of world trade—when U. S. aid halts—will not be a simple one.

But insofar as any category of U. S. exports is deemed absolutely essential by overseas buyers, it is construction machinery and materials. If trade drops, construction exports should hold up quite well. If we succeed in expanding world trade, then construction exports stand to gain considerably.

You can expect the export market for construction products to become somewhat more competitive. Producers of this type of equipment are making determined efforts to expand their share of world sales.

"I could see the corpsman kneeling over me. The blood plasma was running down through a tube into my arm and he said everything was going to be O.K. I was walking across an enemy mine field in Seoul when one exploded and a piece of shrapnel caught me in the leg.

" 'Got enough of that stuff?' I asked him, pointing to the blood. 'I guess we never have enough,' he said, 'but you can thank *somebody* for this pint.'

"How do you thank 'somebody' for blood? For saving your life? When I got back home, I discovered the answer at my local blood donor center. There's only *one* way to say thanks—by giving some of your own blood."

"How do you thank 'somebody' for Blood?"

Yes, all kinds of people give blood—for all kinds of reasons. But whatever *your* reason for giving blood, this you can be sure of: Whether your blood goes to a combat area, a local hospital, or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Business Executives!
✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed employees of your company's plan of co-operation?
- ☐ Was this information given through Plant Bulletin or House Magazine?
- ☐ Has your company given any recognition to donors?
- ☐ Have you conducted a Donor Pledge Campaign in your company?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

Give Blood Now—Call Your Red Cross Today!

National Blood Program

been can be easily demonstrated. During 1952, a total of 111 countries (some of them political subdivisions) bought $1,000 or more worth of parts for construction equipment. Biggest buyers, overall, were: Canada, Colombia, Venezuela, Chile, Brazil, France, Italy, the United Kingdom, Indonesia, Australia, Turkey, the Belgian Congo, and, rather surprisingly, Argentina.

Business briefs . . .

• **New NCA member**—Hydrocarbon Research, Inc., New York City, has been elected to membership in the National Constructors Assn. The firm specializes in design and construction of facilities for the petrochemical and petroleum industries.

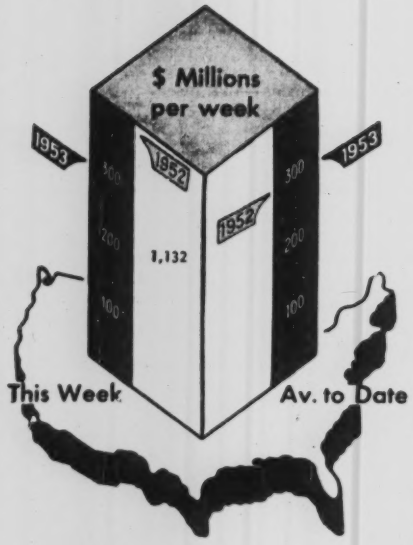
• **Irate over rates**—Although the Georgia State School Building Authority voted to accept the offer made by a banking syndicate for its $63-million bond issue, D. M. Collins, State Superintendent of Schools, was bitterly—and publicly—opposed to the 3.7438% rate on the 18-year bonds. Said Collins: The new rate is more than 1% higher than the authority paid on its $32.1-million issue sold a year ago.

• **Housing starts**—Senate-House conferees have voted to permit the start of 20,000 new low-rent public housing units in the current fiscal year—a compromise between the Senate vote for 35,000 units and a House vote for none at all. Ex-President Truman had asked for 75,000 starts, President Eisenhower for 35,000.

• **Contractors fined**—Nine electrical contractors were fined a total of $16,500 in Chattanooga, Tenn., on charges of violating the Sherman antitrust law. The firms were charged with rigging bids on electrical work. Local 175 of the electrical workers, and its business agent—also charged with violations for refusing to furnish labor except to those who complied with the contractors' agreement—filed a motion in Federal District Court to quash the indictment.

Activity This Week

As reported to ENR (in millions of dollars)



Amount of contracts let

	This Week	Cumulative 31 wks 1953	1952	% chge
Federal	$23.1	$972.9	$2,319.7	−58
State and Municipal	95.2	3,011.7	2,588.4	+16
Total pub.	118.3	3,934.6	4,908.1	−19
Total priv.	179.2	5,250.1	4,185.1	+25
U. S. Total	**$297.5**	**$9,234.7**	**$9,093.2**	**+2**

Contracts by type of work

Waterworks	$4.1	$143.3	$139.3	+3
Sewerage	14.0	243.2	165.4	+47
Bridges	12.8	432.0	237.5	+82
Highways	37.7	1,082.0	929.0	+16
Earthwork, Waterways	5.3	250.6	324.5	−23
Buildings:				
Public, excl. hsg.	29.6	1,032.8	2,141.7	−52
Housg., pub.	2.5	284.9	484.0	−41
Housg., priv.	43.8	2,299.6	1,836.4	+25
Commercial	66.5	724.6	373.6	+94
Industrial	53.2	1,635.5	1,657.4	−1
Unclassified	28.0	1,106.2	804.4	+38
Total	**$297.5**	**$9,234.7**	**$9,093.2**	**+2**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

ENR indexes	1953	Base Years = 100 1913	1926	1949
Construction	Jul	604.10	290.39	126.64
cost	Jun	593.17	285.14	124.35
Building	Jul	435.28	235.19	123.73
cost	Jun	426.27	230.43	121.17
Volume	Jun	572	233	165

OFFICIAL PROPOSALS

Bids: August 17, 1953

Construction of an Intake Tunnel

NOTICE TO BIDDERS

Notice is hereby given that pursuant to a resolution of the Town Board of the Town of Tonawanda, Erie County, New York, sealed proposals will be received and considered by said Town Board on the 17th day of August, 1953, at 8:00 o'clock P.M., Eastern Daylight Saving Time, in the Council Room of the Municipal Building, Kenmore, New York, for furnishing all material, equipment, and together with all labor for the construction of an intake structure in the Niagara River, intake tunnel or pipe conduit, approximately 5,800 feet in length, and riser well, and other appurtenant work, in accordance with the contract documents therefore, including plans, specifications, instructions to bidders, etc., prepared by Nussbaumer, Clarke & Velzy, Consulting Engineers of the Town of Tonawanda, New York, and approved by the Town Board of said Town, all of which are on file with the Town Clerk, at his office in the Municipal Building, Kenmore 17, New York, where the same may be examined during the usual business hours.

Copies of the proposed contract documents, plans, specifications, and instructions to bidders, may also be examined at the office of Nussbaumer, Clarke & Velzy, Consulting Engineers, 327 Franklin Street, Buffalo 2, New York. One Copy of said proposed documents may be obtained upon payment of $35.00. Any bidder, upon returning said plans and contract documents in good condition, within twenty (20) days following the taking of bids, will be refunded the full amount of his deposit; non-bidders will similarly be refunded only one-half the deposit.

The Town Board of the Town of Tonawanda, New York, reserves the right to reject any or all bids, or to waive any informalities, or to make an award to other than the low bidder.

Each proposal must be accompanied by a certified check for a sum equal to five per centum (5%) of the estimated expense of the total improvements, payable to the order of the Supervisor, or a bond with sufficient sureties to be approved by the Supervisor, or a penal sum equal to five per centum (5%) of the estimated expense of the improvement, to wit: $55,000.00 for the total improvement, conditioned that, if his proposal is accepted, he will enter into a contract for the same, and that he will execute such further security as may be required for the faithful performance of the contract.

No bidder may withdraw his bid within sixty (60) days after the date set for the opening thereof, but may withdraw same at any time prior to the scheduled time for the opening of bids.

ROBERT JOHNSON
Town Clerk
Town of Tonawanda, New York

Dated: July 20, 1953
Published: July 23, 1953

Bids: August 13, 1953

THE PORT OF NEW YORK AUTHORITY

REPAIR OF DAMAGE TO FINGER PIER
CONTRACT O & M 199

Sealed proposals for the furnishing of all labor, materials and equipment for the repair of damage to finger pier, Navy Area, Port Newark, New Jersey, will be received at the office of the Director of Purchase of The Port of New York Authority, Room 900, 111-8th Ave., New York 11, until 11:00 A.M. Thursday, August 13, 1953, at which time and place proposals will be opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

OFFICIAL PROPOSALS

Bids: August 6, 1953

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time which is nine-thirty o'clock A.M., eastern standard time, on the 6th day of August 1953, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1				
		G. L. NICKERSON, District Engineer, 353 Broadway, Albany, New York				
Saratoga	D.A. 53-1P	West Milton-Atomic Energy Commission Access Road, Project AA-1 Cont. 2	0.60	Bit. Mac. Type 1	$800 Plans $10	$15,000
Saratoga	FAC 53-15	City of Mechanicville: Central Avenue, Project Project U-UG-319(3) Cont. 1	0.50	9" Cem. Conc. Pavt. 46' Wide	$18,000 Plans $10	322,000
		DISTRICT No. 2				
		L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica, New York				
Hamilton	FASSH 53-11	Speculator-Indian Lake, Pt. 1, Project S-503(3)	10.66	D. S. T. Graded Gravel Comp. I-Beam Br. 55'	$90,000 Plans $50	1,720,000
Oneida	RC 53-99	Rome-Holland Patent Pt. 2, S. H. 8345 Whitesboro-Trenton, S. H. 5325	.....	Removal of 155 trees	$700 Plans $10	13,000
		DISTRICT No. 3				
		WILLIAM ROBINSON, District Engineer, 301 E. Water Street, Syracuse, New York				
Onondaga & Madison	FARC 53-94	Lafayette-Onativia Road, S. H. 9086; Lafayette-Pompey Pts. 1 & 2, S. H. 8332; Pompey-Cazenovia Pts. 1 & 2, S. H. 8391; Syracuse Turnpike Pt. 1, S. H. 9023, Project F-470(16)	13.91	Asp. Conc. Ty. 1A, Opt.	$100,000 Plans $25	1,780,000
Onondaga	PSC 15302	Elimination of N. Y. C. R. R. with Lemoyne Avenue and Lemoyne Avenue, S. H. 49-12	0.47	9" Cem. Conc. Pavt. 52' Wide = 0.45 Mi. Asp. Conc. Ty. 1A, Opt. = 0.02 Mi.; Built-Up Beam (Stringer Type) 77'	$40,000 Plans $15	743,000
		DISTRICT No. 5				
		C. R. WATERS, District Engineer, 65 Court Street, Buffalo, New York				
Cattaraugus	RC 53-104	Various Highways in Cattaraugus County	.....	Removal of 157 Trees	$600 Plans $10	11,000
Chautauqua	FARC 53-102	Penn. State Line-Dunkirk, Pt. 2, S. H. 8334; Dunkirk-Silver Creek, S. H. 8304, Project F-458(9)	1.13	Asp. Conc. Ty. 1A, Opt. = 0.91 Mi. Misc. Work = 0.22 Mi. Twin R. C. Slab Br. 40.6' R. C. Arch 22'	$27,000 Plans $15	$481,000
Erie	FARC 53-89	Hamburg-Springville Pt. 1, S. H. 827, Project 2-369(1)	3.81	Asp. Conc. Ty. 1A, Opt. = 3.79 Mi. Misc. Work = 0.02 Mi.	$25,000 Plans $15	450,000
		DISTRICT No. 6				
		JAMES H. THOMAS, District Engineer, 30 West Main Street, Hornell, New York				
Steuben & Yates	RC 53-96	Br. No. 3 and Br. No. 4, S. H. 8399; Br. No. 3, S. H. 8353; Br. No. 1, S. H. 8146 and Br. No. 2, S. H. 5204	.....	Painting 5 Bridges	$1,300 Plans $10	24,000
		DISTRICT No. 7				
		R. W. SWEET, District Engineer, 444 Van Duzee St., Watertown, New York				
Clinton	FARC 53-101	Ausable Forks-Clintonville, S. H. 476, Proj. F-876(3)	1.88	Asp. Conc. Ty. 1A, Opt.	$13,000 Plans $10	228,000
		DISTRICT No. 8				
		J. S. BIXBY, District Engineer, Pleasant Valley Road, Poughkeepsie, New York				
Ulster	CT 53-10 ST 53-26 RC 53-103	New York State Thruway-Catskill Section-Sub. 4 New Paltz-Whiteport); Route 299 Interchange; Highland-New Paltz, S. H. 1536; Kingston-High Falls, S. H. 229; Eight Town or County Roads	5.39 Acc. 10.21 Thy.	9" Cem. Conc. Pavt. 2 @ 37' Var. Wide = 13.03 Mi.; Asp. Conc. Ty. 1A, Opt. = 0.31 Mi.; T. C. Graded Gravel, D. S. T. = 2.26 Mi.; 5 H. G. S. Comp. I-Beams 276.3'; 197.7', 198', 304' & 199.5' 1 H. G. S. Welded Girder and Comp. I-Beam 75.9', 2 Br.Plate Girder Comp. I-Beam Cantilever, 540' & 356'	$600,000 Plans $100	11,597,000
Westchester & Rockland	HT 53-6	New York State Thwy.-Hudson Sect.-Sub. 9B, Tappan Zee Bridge	1.34	R. C. Rig. Frame Bents on Exist. Fdtn. & Misc. Work	$136,000 Plans $15	2,473,000
Col. Orange Putnam Ulster & Sullivan	RC 53-97	Br. No. 2, S. H. 1563; Br. No. 2, S. H. 8359; Br. No. 4, S. H. 95; Br. No. 2, S. H. 8424; Br. No. 1, S. H. 5203; Br. No. B-1, S. H. 351; Br. No. 3, S. H. 603; Br. No. 1, S. H. 1464 & Br. No. 2, S. H. 8441	.....	Painting 9 Bridges	$1,200 Plans $10	22,000
		DISTRICT No. 9				
		F. W. DONOVAN, District Engineer, 71 Frederick St., Binghamton, New York				
Broome	FARC 53-90	Lisle-Center Lisle, S. H. 445, Lisle Village: Main Street, S. H. 1608, Project F-608(6)	3.32	Asp. Conc. Ty. 1A, Opt.	$18,000 Plans $10	315,000
Chenango	FARC 53-98	Bainbridge-Unadilla Pts. 1 & 2, S. H. 5013-5216, Robbins Crossing = S. H. 5454, Project F-420(12)	3.34	Asp. Conc. Ty. 1A, Opt.	$13,000 Plans $10	230,000
Chenango & Broome	RC 53-100	Brs. No. 1, 2 & 3 Whitney Point-Greene Pt. 1A, S. H. 8489; Brs. No. 2, 4 and 6 Harpursville Station-Coventry Pt. 2, S. H. 1901	.....	Repair & Paint 6 Bridges	$3,000 Plans $10	54,000
		DISTRICT No. 10				
		M. E. GOUL, District Engineer, Montauk Highway, Babylon, L. I., New York				
Nassau	FASG 53-6	Peninsula Boulevard, Project SG-319(2)	0.66 RR 0.21 HY.	9" Cem. Conc. Pavt. 2 @ 24' Wide = 0.20 Mi. Misc. Work = 0.01 Mi. RR Track Work = 0.66 Mi. RR Sep. Plate Girder 92.7' Br. Twin Box 21.2'	50,000 Plans $15	853,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

INSURE COMPETITION

and get the lowest possible bid for your proposed work by placing your bids wanted advertising in this Section.

Don't limit competition to local bidding alone. Bring it to the attention of contractors the country over. They read this Section every week—make sure your bid is here where they can read it.

OFFICIAL PROPOSALS

Bids: August 11, 1953

Route 44 (1927) U. S. 130 (1953), Sections 9C, 11B, 14B & 15C

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

Route 44 (1927) U.S. 130 (1953), Sections 9C, 11B, 14B & 15C, from Woodbury Creek to Berkley Road, Paving, in the Townships of East Greenwich, West Deptford and Greenwich, and Borough of Paulsboro, Gloucester County, Federal Project No. U-122 (12). Length 3.895 miles. The principal items of construction are:

Estimated:

55,741 cu. yds. Roadway Excavation-Earth
73,495 cu. yds. Borrow Excavation
48,519 cu. yds. Subbase 8" thick
57,926 sq. yds. Gravel Shoulders, 8" average thickness
256,000 sq. yds. 4" Topsoiling
67,905 sq. yds. Macadam Base Course, 6" thick
67,905 sq. yds. Pavement, Type MA-IIC-2, 3" thick
101,994 sq. yds. Conc. Pavement Surface, Rein. 9" thick
2,471 sq. yds. Conc. Pavement Surf. Rein. 13-½" average thickness
1,765 sq. yds. Bridge Approach Slabs, Rein. 18" thick
6,074 lin. ft. Rein. Concrete Pipe
64 Inlets
41,286 lin. ft. White Conc. Vertical Curb
8,440 lin. ft. White Conc. Sloping Curb
11,034 lin. ft. Wire Rope Fence

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, August 11, 1953, at ten o'clock (10:00 A.M. EASTERN STANDARD TIME), eleven o'clock (11:00 A.M. DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the revised statutes of New Jersey and supplements, and by P. L. 413, 82nd Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 21 Delaware Street, Woodbury, New Jersey. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 129, State Highway Office Building, 1035 Parkway Ave., Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000, and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: August 5, 1953

Furnishing and Delivering Fire Hydrants

WASHINGTON SUBURBAN SANITARY COMMISSION
CONTRACT NO. 1285-W

Sealed proposals for furnishing and delivering twenty-five (25) 5-½-foot; ten (10) 6-foot; twenty-five (25) 6-½-foot; fifteen (15) 7-foot; ten (10) 7-½-foot and four (4) 8-foot fire hydrants will be received in the Office of the Purchasing Agent, Room 3, of the Washington Suburban Sanitary Commission, Hamilton Street, Hyattsville, Maryland until 11:00 A.M., Eastern Daylight Saving Time, Wednesday, August 5th, 1953, at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Raymond W. Bellamy, Chairman
L. S. Ray
J. Norman Ager
Commissioners

Attest:
James B. Parkhill
Secretary-Treasurer

Bids: August 11, 1953

NEW JERSEY TURNPIKE AUTHORITY
NEW BRUNSWICK, N. J.

CONTRACTS NO'S. 99A, 99B, 99C, 99D and 99E

The work to be performed under these contracts involves, respectively, the general construction work, the structural steel and miscellaneous metal work, the heating, ventilation and refrigeration work, the plumbing and drainage work and the electrical work all in connection with additions and alterations to the Service Buildings at Service Areas 10N and 10S, located on the New Jersey Turnpike in Middlesex County, New Jersey.

Sealed proposals will be received at the office of the New Jersey Turnpike Authority, Administration Building, New Brunswick, New Jersey, on the morning of August 11, 1953 until 11:00 A.M., Eastern Daylight Saving Time, at which time and place said proposals will be publicly opened and read.

The receipt and opening of proposals are subject to proper prequalification of the bidder in accordance with the regulations adopted by the New Jersey Turnpike Authority.

Contract documents may be examined during office hours after July 27, 1953 at the office of the New Jersey Turnpike Authority, Administration Building, New Brunswick, New Jersey. Contract documents will be furnished on the payment of Five Dollars ($5.00) for each set. The payment will not be refunded and contract documents are not required to be returned.

NEW JERSEY TURNPIKE AUTHORITY
July 27, 1953 — Paul L. Troast, Chairman

Bids: September 10, 1953

Sewers, Pumping Station and Treatment Plant

CITY OF TERRE HAUTE, INDIANA

The city of Terre Haute, Ind. will publicly receive sealed bids for constructing three contracts of sewage disposal project, until 10 a.m. Central Standard Time on September 10, 1953 at Board of Public Works and Safety, City Hall, Terre Haute.

Drawings and contract documents may be examined and may be obtained on deposit of $50 per set per contract at above office and as follows: Contract 1, Intercepting, Connecting, and Outfall Sewers and Force Main from Hardman Engineers, Wabash Theatre Bldg., Terre Haute; Contract 2, Pumping Station, and Contract 3, Treatment Plant, both from Metcalf & Eddy, Engineers, 1300 Statler Bldg., Boston, Mass.

Bid security: certified check, bank draft, or bid bond for five percent of bid. Successful bidders must furnish 100 percent contract bonds. Wage rates prescribed.

BOARD OF PUBLIC WORKS & SAFETY

Bids: August 20, 1953

Patterson-Riverside Bridge

CITY OF DAYTON, OHIO

Sealed proposals will be received at the office of the Director of Service and Buildings of the City of Dayton, State of Ohio until 12:00 o'clock noon Eastern Standard Time, Thursday, August 20, 1953 for furnishing all materials and constructing the Patterson-Riverside Bridge over the Great Miami River including the north approach thereto, at which time they will be publicly opened and read.

The project embraces the construction of a continuous steel girder bridge with reinforced concrete deck and substructure 4 lanes in width and approximately 670 feet in length. The north approach, approximately 850 feet in length, to be 44 foot wide concrete pavement.

The approximate quantities of the principle items are as follows:

Concrete	5400 Cu. Yds.
Structural steel	2,500,000 Lbs.
Reinforcing steel	420,000 Lbs.
Steel H. piling	12,400 L.F.
Concrete pavement	4350 Sq. Yds.

It is assumed that the total cost of the improvement will not exceed $1,203,500.00. Bids shall be accompanied by a certified check upon some solvent bank or a bond executed by a surety company authorized to do business in Ohio, or a bond of the United States or the City of Dayton for a sum equal to 5% of the amount of the bid submitted as a guarantee that if the bid is accepted, a contract will be entered into and its performance properly secured. Plans, specifications and proposal forms may be obtained from the City Engineer, 500 Municipal Building, Dayton 2, Ohio, upon payment of $25.00 per set. Checks shall be made payable to the City of Dayton. Refunds will be made for the return of plans and specifications. The City reserves the right to reject any or all bids or to accept the proposal which appears most advantageous.

George F. Baker, Director
Dept. of Service & Buildings
500 Municipal Building
Dayton 2, Ohio

Bids: August 13, 1953

THE PORT OF NEW YORK AUTHORITY FOUR-WHEEL DRIVE DUMP TRUCK

CENTRAL SHOP
PROPOSAL NO. 176

Sealed proposals for furnishing one four-wheel drive dump truck with catch basin cleaner and snow plow, for delivery to the Central Shop, 773 Washington Street, New York, will be received at the office of the Director of Purchase of The Port of New York Authority, Room 900, 111 8th Ave., New York 11, until 11:00 A.M. (E.D.S.T.), Thursday, August 13, 1953, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

Bids: August 10, 1953

Sanitary Sewers

Rockford, Illinois—Board of Local Improvements Sanitary Sewers $48,460 in Huffman Blvd Area Bids August 10, 1953. 6% Special Assessment Bonds.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4005) will be received at Denver, Colorado, until 2 p.m., August 20, 1953, for furnishing two (2) fixed-wheel gate hoists with accessories and controls for Palisades Dam and Power Plant, Palisades Project. Delivery is desired within 360 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado.

FRED G. AANDAHL, Assistant Secretary for Water and Power Development
Department of the Interior

GOV. OF DIST. OF COL., DIR. OF HIGHWAYS, D. C., July 15, 1953. SEALED PROPOSALS will be recd. in Rm. 404, 499 Pa. Ave., N. W., Wash. 1, D. C., until 2 PM, DST, August 19, 1953, and then publicly opened and read for construct. an underpass and a trunk sewer on E. Cap. St. under 19 tracks of the Penna. and B & O Railroads, with an encased steel beam superstructure on reinf. conc. abutments and pier. (Fed. Aid Proj. U-UG 42-(4). Proj. length is 524 ft. Approx. quantities of major items in the underpass are: 42,000 cu. yds. excavation, 9,800 cu. yds. conc., 520,000 lbs. reinf. steel, and 2,230,000 lbs. structural steel. Approx. quantities in the 15' x 10'-6" trunk sewer: 8,200 cu. yds. excavation, 1,600 cu. yds. conc. and 315,000 lbs. reinf. steel. Proposal forms, plans and specns. obtainable upon deposit of Cert. Check, payable to Collector of Taxes, D. C., for $50.00 per set, from Supervisor, Contr. Soc., Procurement Office, D. C., Rm. 406—499 Pa. Ave., N. W. (Tel. NA 8-6000, Ext. 2378).

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
(Not available for equipment advertising)
$1.50 cents a line, minimum 3 lines. To figure advance payment count 5 average words as a line.
POSITION WANTED & INDIVIDUAL SELLING OPPORTUNITY WANTED undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, $1.50 a line an insertion.

INFORMATION:
BOX NUMBERS count as 1 line additional in undisplayed ads.
DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).
EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED—RATE PER INCH:
The advertising rate is $17.10 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches —to a page. E.N.R.

NEW ADVERTISEMENTS: Send to New York City Office, 330 W. 42nd St., N. Y. 36 for August 13th issue closing July 27th

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

SALES ENGINEER—Civil Engineer needed to promote the use and sale of welded wire fabric concrete reinforcement and to provide local salesmen with engineering counsel on product application. Highway and other construction experience desirable. Age 30 to 40. Headquarters in New York. Considerable travelling. Starting salary approximately $600. per month. Write giving age, education, experience, personal qualifications, etc. P-8546, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT wanted for work in N. J. with experience in highway construction. Must be capable of taking complete charge of work which includes all types of excavation, drainage & paving. Must have engineering knowledge & be cost conscious. Permanent position for the right man. Give resume. P-8550, Engineering News-Record.

PROJECT ENGINEER — Thoroughly experienced Contractors Engineer—preferably on Public work. It's located 40 miles out of Washington. Salary to start $10,000.00 per year. Write full details. P-8500, Engineering News-Record.

ESTIMATOR WANTED by General Contractor located in South. Applicant to have experience in estimating all types of building construction. Excellent opportunity for energetic person with growing company operating in southeastern U. S. Write fully, giving experience, education, personal details and salary desired, to Blount Brothers Construction Company, Box 1144, Montgomery, Alabama.

EXPERIENCED ELECTRICAL maintenance engineer. Primary duty to service and maintain electrical equipment in several large material producing plants. Must be familiar with large high-voltage electric motor installations. Good permanent position for right man. P-8520, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT — Age 30-40 with minimum of 10 years experience in industrial and commercial construction. Complete charge of field activities of small (75 employees) long established general contractors. Give full particulars in application. Salary open. Location in Southeastern Pennsylvania. P-8518, Engineering News-Record.

BRIDGE DESIGN Engineers and Draftsmen experienced in highway design and preparation of contract drawings for expressway work. Furnish full information regarding education, experience, age, references and salary required. Replies confidential. Associated Consulting Engineers, 1606 Kelly Ave., Baltimore 9, Maryland.

WANTED—CONSTRUCTION Superintendents. Permanent. Willing to Travel. Ages—30 to 40 years. Engineers preferred. Immediate assignment. Lewis C. Bowers & Sons, Inc. Princeton, N. J. PHone 2091.

FOREMAN, WHO knows Sewer and Water Line construction and who can manage men. Located Indianapolis, Ind. Submit qualifications, salary expected, aavilability. P-8606, Engineering News-Record.

BUILDING SUPERINTENDENT to act as Project Manager, want experienced man, who knows plans thoroughly. Prefer man who has laboratory or hospital experience. Job located 40 miles from Baltimore and Washington. Good opportunity and top pay for right man. Write full details. P-8527, Engineering News-Record.

SELLING OPPORTUNITIES OFFERED

SALES ENGINEERS—Albany, New York and Pittsburgh, Pennsylvania with established national concern selling prefabricated metal products to engineering and construction markets. Position offered is permanent and presents excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Age 24 to 30. SW-8254, Engineering News-Record.

MANUFACTURER'S AGENTS wanted for territories in North Central United States to handle steel and aluminum railings for bridges and buildings. All territories open. Agent must carry allied lines. Write or call: National Railing Corporation, 4319 West 32nd Street, Chicago 23, Illinois. Phone: LAfayette 3-1633.

POSITIONS WANTED

CHIEF ACCOUNTANT — Office Manager seeks position in Latin America; 10 yrs. experience in Latin America; 10 yrs. experience in L.A. countries on engrg. and construction projects handling accounting, office management. Legal liaison work. Fluent Spanish. Also 10 yrs. accounting experience in U. S. Age 43, married. PW-8330, Engineering News-Record.

GENERAL SUPERINTENDENT 25 years diversified heavy construction experience. Good background, know men and equipment. Available any location immediately. PW-8549, Engineering News-Record.

FIELD OFFICE Manager, heavy construction, available immediately. PW-8545, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT: concrete pipe manufacturer, considerable experience. PW-8446, Engineering News-Record.

C.E. 23 yrs office engineering experience. 12 yrs supervisory and executive positions. Desire exec. position with established firm wherein engineering background would be an asset. Salary $8-10,000. Prefer West. loc. PW-8388, Engineering News-Record.

PROFESSIONAL ENGINEERS with 2 years experience on Bridge Detailing and Design with State Highway Dept. desires additional work. Located midwest. PW-8569, Engineering News-Record.

CIVIL ENGINEER, 29, Single, B.S. degree, 4½ years highway design & const. Desire constant or frequent travel. Present location Calif. PW-8578, Engineering News-Record.

ESTIMATOR: ENGINEER planner plant construction, project control, business trained. PW-8600, Engineering News-Record.

CIVIL ENGINEER, 31, married, MS in CE. Experienced in hydraulic model studies and general civil engineering research administration. Soon to be released from active duty with Navy Civil Engineer Corps. PW-8598, Engineering News-Record.

CARPENTER-FOREMAN—thoroughly experienced, heavy construction preferable—A1 references. P. P. Bendzlowicz, Tel Laurelton 8-4734.

ESTIMATOR WITH field experience as Superintendent familiar with all types of Building Construction. Also experienced in making Engineering Estimates for Engineers. References, address E. Harold Bowen, 1108 E. Belvedere Ave., Baltimore 12, Md.

ESTIMATOR-SALESMAN: — Structural Steel and Steel Products. Eighteen years diversified experience in engineering, production and sales. General construction background. Executive capabilities. PW-8641, Engineering News-Record.

(Continued on page 135)

CONSTRUCTION MEN'S ASSOCIATION

JAMES H. DILLON, President

DEDICATED TO THE PROMOTION OF BETTER LABOR-MANAGEMENT RELATIONS IN THE FOREIGN CONSTRUCTION FIELD

A mutual welfare, voluntary membership association now in its tenth year. Membership, 10,900 construction specialists and technicians who make a life career of working in foreign countries for American contractors. The only organization of any kind in this field. Cooperates with contractors, government agencies, Army, Navy, Air Force, Engineers' Corps. Skilled personnel provided without payment of a fee by anyone, in every category from Project Manager to Operator. Advice or consultation gladly given without obligation, on any aspect of personnel relations or recruitment for foreign projects. Inquiries invited.

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HAnover 2-9747

BRANCH OFFICE
Terminal Hotel, 60 Market St.,
San Francisco
YUkon 6-5308

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Graduate Civil Engineer, Registered, 47, single, good health and habits. Have owned and operated own construction business past 16 years. Work involved refineries, sewage disposal plants, concrete steel and frame structures, housing, heavy construction, sanitary and storm lines, pipe lines, process plants, highway construction and asphalt surfacing.

At present employed by very large concern in its construction department, management position in charge of multi-million dollar project at salary of $12,300 annually.

Prefer connection with contracting firm (medium or large) where my past experience, creative mind, enthusiasm, high integrity, ability to deal with and handle people, to express self and to handle work from preliminary planning or promoting to acceptance stage can be used to full advantage. Have been an employer therefore know what the employer expects and must have to compete in present field. Therefore prefer salary and bonus which means I must make you money in order to make me money.

Foreign Service considered.

PW-8566, Engineering News-Record
330 W 42 St., New York 36, N. Y.

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AND
DESIGNERS

With experience applicable to Oil Refinery, Blast Furnace or Steel Plant Design.

Openings available at our Cleveland, Ohio offices for:

Piping Designers
Structural Designers
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These openings offer:

Top Hourly Rates
Permanent Positions
Overtime—45 hour week
No Age Limitations

Write, giving complete background and experience to:

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2300 Chester Ave.
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WANTED!!
Earthmoving Field
ENGINEERS

Responsible field positions within the continental United States are now available in connection with this Company's expanding sales program.

Earthmoving men with civil engineering degrees and experience in the application of heavy earthmoving equipment are desired.

Salary offered is commensurate with qualifications and experience. An account for traveling expenses is also provided. In addition, Company benefits including group hospitalization and life insurance plans, a contributory retirement plan, and annual paid vacations are available.

Send full particulars of education and business experience, with a recent photograph to—

Mr. J. B. Coogan
Sales Department
Caterpillar Tractor Co.
Peoria, Illinois

TOOL DESIGN
SUPERVISOR

Man capable of assuming complete charge of Tool Design Dept. and development of designers in lower classifications.

MECHANICAL ENGINEERS

Graduate or equivalent experience.

MANUFACTURING ENGINEERS

Fabrication & machining experience.

These are permanent openings with one of America's oldest and largest Mfg. Concerns. Salaries open. Give complete record of experience, education, age and salary requirements in first letter. Address G. R. Carmack Supervisor of Employment.

WESTINGHOUSE
ELECTRIC CORPORATION
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ESTIMATORS

Young engineers capable of mechanical estimating for construction of refineries, steam power and similar industrial projects. Must have some field experience.

Considerable weight given to ambition, intelligence and interest in estimating and cost analysis.

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San Francisco, California

WANTED
ESTIMATOR

With extensive experience and executive ability, capable of estimating mechanical phases of Sewage Treatment and Water Purification Plants.
Pleasant working conditions in ideal Contractor's office located in Northern Ohio. This position offers unlimited opportunity and future.
Pay will be commensurate to past experience and personal ability.
Sanitary Engineering background preferred.

P-8362, Engineering News Record
520 N. Michigan Ave., Chicago 11, Ill.

ENGINEER

Drafting Checker — Mechanical or Civil Engineer with a minimum of five years experience in design and detailing preferably in the chemical industry. Position entails checking of structural and process designs.
Cost Estimating Engineer—Chemical Engineer with 5/10 years experience in Chemical Process equipment design including some cost estimating experience. Responsible position involving cost estimating and design of new chemical processes.

Apply Director of Personnel

J. T. BAKER CHEMICAL COMPANY
PHILLIPSBURG, N. J.

BRIDGE - HIGHWAY ENGINEERS
DESIGNERS - DRAFTSMEN

For work on major bridges, expressways, and turnpikes. Permanent positions with periodic promotions depending on experience and ability. Paid vacations, sick leave, hospitalization and life insurance. Include experience, salary requirement in first letter. Photograph optional.

Howard, Needles, Tammen & Bergendoff
Consulting Engineers
1805 Grand Ave., Kansas City 8, Mo.

WANTED—An experienced
CONSTRUCTION SUPERINTENDENT

Large well established Chicago building contractor desires services of general supt. Age preferably 35-45.

Must be cost conscious, able to sit in on pricing. Building projects located in Chicago and Midwest.

Excellent salary and bonus. Replies confidential.

P-8582, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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CONSTRUCTION SUPT.
Must be thoroughly experienced in steam electric power plant construction.

CONSTRUCTION FIELD ACCOUNTANT
Must have experience in construction accounting & related work.

COST ENGINEER
Experienced engineer to do construction cost work.

ABOVE POSITIONS OFFERED BY LARGE NEW YORK ENGINEERING & CONSTRUCTION FIRM

Must be willing to relocate.
SUBMIT COMPLETE RESUME.

P-8515, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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Experienced Sanitary Engineer to assume complete charge of department handling water supply, treatment and distribution and sewage collection and treatment projects for a downstate Illinois, well established, financially stable firm of Consulting Engineers. Salary plus bonus totalling $10,000 or more to attract qualified engineer with supervisory experience. Send picture (if available) with full details on experience and training in first letter. Replies will be treated confidentially.

P-8660, Engineering News Record,
520 N. Michigan Ave., Chicago 11, Ill.

ENGINEERS

Structural, mechanical, and electrical for work on hydro-electric power developments. Write giving full experience record and qualifications.

HARZA ENGINEERING COMPANY
400 West Madison Street Chicago, Illinois

EXPERIENCED
STRUCTURAL STEEL DETAILERS

Salary Commensurate with experience.

Darbyshire Steel Co., Inc.
P. O. Box 352 El Paso, Texas

Additional Position Vacant Advertising on page 133

POSITIONS WANTED
(Continued from page 133)

DUTCH CIVIL engineer M.S. married, 26. 2 years foreign experience as Design Engineer with American Oil company. Desires position anywhere in U. S. or foreign. Available February 1954. PW-8632, Engineering News-Record.

STRUCTURAL DESIGNER—graduate C.E., 29, ambitious, with 5 yrs. experience designing and supervising designs and details of various structures (mostly steel) for bridges, dams, power plants, and oil refineries. Prefer 100 mile radius of N. Y. City but outside metropolitan area. PW-8613, Engineering News-Record.

GENERAL FOREMAN or Asst. Supt. 20 yrs experience in heavy construction, roadwork, sewer, tunnel & subway concrete. PW-8616, Engineering News-Record.

CONSTRUCTION MAN, long New York City experience, heavy construction and buildings, from bid to completion, now on large project, seeks contacts with Contractors interested in high grade man as Project Manager or in similar executive position, in New York or vicinity. PW-8634, Engineering News-Record.

WORK WANTED

C.E. TEAM available for small free lance structural design & detailing of Industrial and Commercial Bldgs and foundations. WW-8576, Engineering News-Record.

Engineers—Foremen—Office Men

Learn latest methods to organize and run work. Prepare for the top jobs.
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ARCHITECTURAL ENGINEERING
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WILSON *Engineering Corp.*
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Will arrange thru purchase of (1) Capital stock, (2) Assets, (3) Machinery and equipment, whole or in part—Personnel usually retained, strict confidence. **Box 1351,** Church St. Sta., New York 8, N. Y.

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BAILEY BRIDGE, complete.
Send detailed information including price & location.
MASON AND BACON COMPANY
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1201 LIMA
1201 Lima, Wisconsin gasoline engine, completely rebuilt, excellent condition, 130' Heavy duty boom, used as crane only, immediate delivery, F.O.B., **Wilmington, Delaware** **$40,000.00**
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TENDER OR WORK BOAT
Length 40', Beam 11'
Wooden Hull and Cabin
141 H.P. Chrysler Marine Engine, 6½ Reduction Gear. Located: Atlantic City, N. J.
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FOR SALE
Northwest Crane with 65 ft. Boom
Model 6 Gas Engine Serial No 7824
1½ yd Page Drag Line Bucket
1½ yd Johnson Clam Shell Bucket with teeth
Owens Rock Grab, 4 Ton Capacity, Size 51, Type R.A.
Excellent Condition
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AN AUCTION
HEAVY EQUIPMENT

Monday, August 10th at 11 A.M. (EST) 14 miles NW of Clarksburg, West Virginia, or, about 100 miles South of Pittsburgh, Pa. Each-Piece-Positively-Sells-To-The-Highest-Bidder-Without-Minimum-Limit-Or-Reservation. Sale due to heart attack of owner. Most of this equipment is late model, it has not had hard usage, is one owner equipment, not been out on rental, and has been used on one-shift only, is in excellent condition thruout, ready for the job.

Two Lima 1201 Hi-Lift Shovels, S/N 4478 & 3653, the one machine has actually been operated one season, the other two seasons only. Both have Cummins "L" type Diesel power, 44" swamp pads, 18' 11" crawlers, 34' boom, 27' dipper, 3 c.y. manganese front dipper, air controls, 1500 Watt EH Kohler lite plant, standard gantry. Both excellent condition. **Lima 802 shovel** 2 yard, S/N 3080 Cat D17000, had a complete overhaul and not used since, engine overhauled 18 months ago. Very good condition thruout. **Lorain Model 87 shovel,** S/N 2814, Waukesha-Hesselman diesel, hi lift front, 1¾ yd, machine ready for work. **Wayne Crane, Clam-shovel-drag,** on rubber, machine has had very little use, excellent shape. **Lorain 75B shovel,** S/N 4971, Cat D8800, good operating shape. The Lorain 820 boom and dipper on this machine had 1 season use, will fit the current 820, will be sold separately. **2 yd PMCO dipper bucket, 1¾ yd Page drag bucket, 1¾ yd Amsco dipper bucket, 1¾ yd Esco almost new dipper bucket, 1½ yd Amsco dipper bucket—excellent, Owens ⅜ yd clamshell.**

Cat D-8, S/N 2U-6314, w/8A angle dozer and Cat # 25 DDPCU, lights, 5392 hours. **Cat D-8,** S/N 1H-9640, Cat angle dozer & LeT DDPCU. **Cat D-7,** S/N 6T-398, dozer & LeT DDPCU, 9620 hours. **IHC TD-18 angle dozer** & DDPCU, fair to poor. **Cat D-2** w/angle dozer, Hyster D-2 winch, S/N 5J-9304, in excellent shape.

2 Euclid rear dumps, S/N 27FD6011 & 27FD-6012, both Cummins 150 hp, good rubber, good condition thruout. **2 Euclid rear dumps,** S/N 28FD-5657 & 28FD6829, both 150 hp Cummins, good rubber, good condition throughout. **Three sets steel Euclid sideboards. Warco** YD104 motor grader, scarifier, IHC Diesel. **Buffalo-Springfield 10 ton roller,** hydraulic, used very little. **LeT H-3 Ripper,** exc; Goose neck extension & blocks for 802 Lima; 10' boom section & 2 sets counterweights for 802 Lima; Counterweight & fuel tank for 80D Northwest. **300 amp Hobart welder; Hardsocg vertical 4" drill & auger. Permanco horizontal 6" drill & auger; 3 Hardsocg coal drills. McCartney 6" drill hydraulic,** auger, on a truck; '45 Chev 4x4 truck w/2 compt 750 gal tank, pto pump; **7 White WB dump trucks** w 7-11 steel Penn bodies, 7" telescoping hoist, 2 are '48, 5 are '47, all in very good condition, good rubber. **White WB '47 10 wheel dump truck. 6 White WA dump trucks,** '45 models, equipped same as WB's, all good shape. Other trucks. Many other items.

This is a complete sale of the owner's equipment, 2 tipples will be sold same day, sale due to heart attack of owner. WIRE-WRITE-CALL Auctioneers for complete sale bill. TERMS:—Complete payment sale day, cashier's check or Bank Draft only will be accepted. EACH PIECE POSITIVELY SELLS TO THE HIGHEST BIDDER WITHOUT ANY MINIMUM LIMIT OR RESERVATION!!!

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Our 3 decades of diversified experience in rebuilding heavy construction equipment, quarry equipment and trucks, can be of invaluable help to you in rebuilding your equipment.
L. B. Smith's proved ability to do the job right . . . the way you want it done . . . can provide important savings in time and money.
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CAMP HILL, SUBURB OF HARRISBURG, PA.

L. B. SMITH INC.

New and Used Equipment News

Prepared Monthly by Ed Woolford at Camp Hill, Pa.

VOL. 2 NO. 3

AIR COMPRESSORS

Gardner-Denver 500 cu. ft. diesel, new condition.
Gardner-Denver 500 cu. ft. diesel, good operating condition.
Gardner-Denver 365 cu. ft. diesel.
Worthington two-stage, water-cooled, vertical 250#, 60 CFM, new condition.
Paving breakers, jackhammers, wagon drills, tie tampers.

QUARRY EQUIPMENT & BINS

2540 Cedarapids 4A primary unit, diesel power.
2036 Cedarapids AAA primary unit on rubber, diesel power. Rebuilt.
1036/2418 Cedarapids Jr. Tandem unit on rubber.
Cedarapids Rock-It plant w/2025 jaw, 3033 hammermill. New.
4033 Cedarapids Model 6C plant. New.
2020 Cedarapids double impeller. New condition.
4024 Cedarapids roll. Rebuilt.
3018 Cedarapids roll. Rebuilt.
1036 Cedarapids jaw. Rebuilt.
10x7 Allis Chalmers lake type jaw crusher. Rebuilt.
B-3 Jeffrey swing hammer pulverizer. Rebuilt.
60" dia. x 14' long Traylor revolving screen. Rebuilt.
24" Wemco single pitch sand screw. New condition.
15 cu. yd. Cedarapids sand drag. New.
16" x 90' bucket elevator.
60-ton, 2-compartment, 8' x 18' storage bin w/clam gates.
100-ton, 2 compartment, 13'x23' storage bin.
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also belt.
24" Dia. x 30" face magnetic pulley.

TRUCKS—TRAILERS

1½-ton Ford with any body.
2000-gallon tanks on semi-trailer mounting.
New and rebuilt dump bodies.

GENERATORS & LIGHT PLANTS

1½ KW to 125 KW, alternating and direct current gasoline and diesel powered.

SHOVELS—CRANES

Lorain 77, 1½-yd. diesel.
Lorain 75B, 1¼-yd. diesel.
Lorain 57, 1¼ yd. diesel, rebuilt.
Lorain L-50-I, 1-yd. diesel.
Lorain 40 truck crane on Mack 3-axle truck.
Link Belt LS85 diesel combination. Rebuilt.
Unit 514, ½-yd. gasoline crawler shovel, rebuilt.
Lorain 30A, ½-yd. gas combination.

SHOVEL & CRANE ATTACHMENTS

Lorain L-41 Chain Crowd Shovel Attachment. Rebuilt.
Lorain 40 Hi-Lift shovel attachment.
P&H 203 shovel attachment.
Chain crowd Lorain 30A shovel attachment.
Bucyrus-Erie 1½-yd. rock bucket.
McCaffrey Model 648 for 1¼ to 2-yd. crane.
McCaffrey Model 636 for ¾-yd. to 1-yd. crane.
Lorain 77 crane boom, 45'.

BACKHOE BUCKETS & ATTACHMENTS

Lorain 30 hoe attachment complete.
¾-yd. Lorain, 40, LBS #6105. 44" cutting width.
¾-yd. Amsco 40" cutting width, LBS #8101.

CLAM—DRAG—SCRAPER BUCKETS

LIFTING MAGNETS

1—45" Ohio lifting magnet, rebuilt.

SHOVEL DIPPERS

Lorain 41, ¾-yd. LBS #8600, rebuilt.
Bucyrus-Erie 1¼-yd. gas air, LBS #3782, fair.
Lorain 75B, 1½-yd. manganese bucket, LBS #8538.
Lorain 75B, 1¼-yd. extended lip, 1¾-yd. LBS #2260.
Pettibone-Mulliken 2-yd. Lorain 82 or 820, manganese, LBS #5361.
Pettibone-Mulliken 2-yd. for 3500 Manitowoc LBS #5763.
Esco 2½-yd. cast weld dipper with bail & teeth.

CONCRETE EQUIPMENT

Blaw-Knox gas-electric finisher, 10½'-12½', rebuilt.
Koehring 10'-12' finishers, rebuilt.
Cleveland formgrader, new 1944 rebuilt.
Corr formgrader, new 1944, rebuilt.

TRACTORS

TD-24 International with Bucyrus-Erie angleblade.
TD9 International diesel with 1 yd. Loadover.
Model CR Tournapull w/16-yd. Model E16 Tournarocker, rebuilt.

WELL DRILLS & TOOLS

Sanderson-Cyclone #42 well drill, new.
Sanderson-Cyclone #44 well drill, new.
Bits—Stems—Bailers—Sockets—Etc.

Barber-Greene 44C Trenching machine 18" to 24" cutting width, 7' depth.

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New Layne Bowler type 18 deep well pump with right angle gear drive. 3000 GPM at 120' TDH.
Used and rebuilt pumps, all sizes, gasoline, electric or diesel.

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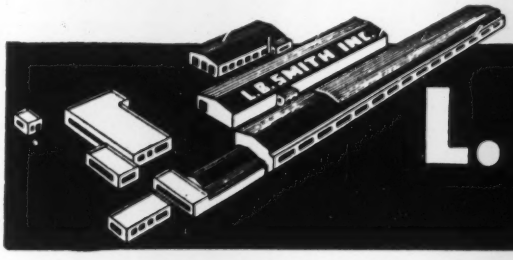
Caterpillar D-13000, rebuilt.
Murphy ME-6, & ME-48, rebuilt.
Caterpillar D8800.

***Phone* HARRISBURG, PA. 7-3431**



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We have 8 to 48

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TOUGH COVERS—Heavy duty, specially compounded abrasive resistant rubber covers having high tensile strength. Thoroughly capable of withstanding the abrasive action of bulk materials. Properly vulcanized to the carcass to assure utmost performance, economically.

STRONG CARCASS — Constructed of finest quality 28 and 32 ounce tough cotton duck, properly treated and impregnated to avoid mildew from moisture and atmospheric conditions. Each ply thoroughly embedded in rubber to prevent ply separation.

FLEXIBILITY — Careful attention has been given in the construction of all belts to have the proper flexibility assuring the following desirable features; troughs easily, runs true on all idlers, gouge resistant, excellent for long and short hauls and slope installations.

Avoid delays in your production schedules!

We carry in stock for your immediate requirements, Conveyor Belting in widths from 8 inches to 48 inches.

Width	Ply	Thickness Top Cover	Thickness Bottom Cover	Type of Duck Carcass
8"	4	1/16"	1/32"	28 Oz.
10"	4	1/16"	1/32"	28 Oz.
12"	4	1/16"	1/32"	28 Oz.
14"	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Oz.
42"	5	1/8"	1/16"	32 Oz.
48"	5	1/8"	1/16"	32 Oz.
48"	8	1/8"	1/16"	32 Oz.

INQUIRE FOR SIZES NOT LISTED ELEVATOR TRANSMISSION & V-BELTING ALSO IN STOCK

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2—G.E. 25 Ton—Diesel-Elec.—1951.
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3—HOPPER CARS—50 TON
18—MAGOR 30 YD. AIR DUMP—DROP DOORS

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Southwark 500 Ton Hydraulic Press—High-Speed—Like New.
Southwark 100 Ton Hydraulic Press.
Mundy 2-Drum Elec. Hoist—300 H.P. Like New.
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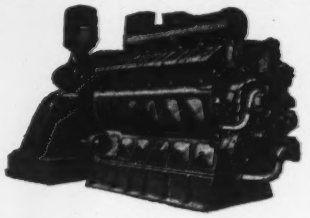

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1980	Nordberg	T8-217	2800	225	320	Enterprise	D8G-6	560	450
1500	Fairbanks Morse	33E16	2000	300	300	General Motors	8-268A	450	1200
1136	Fairbanks Morse	38D	1600	720	250	Fairbanks Morse	37-E	375	360
1100	General Motors	16-278A	1600	720	200	General Motors	8-268A	350	900
750	General Motors	12-567	1080	720	150	Worthington	CC-4	225	450
500	Baldwin	VO-8	750	514	150	Buckeye	80	240	600
500	General Motors	8-278A	750	720	100	Worthington	BB-5	150	600
500	General Motors	8-567	720	720	100	General Motors	3-268A	150	1200
400	Ingersoll-Rand	8-8	600	720	60	General Motors	6-71	90	1200
350	Baldwin	VO-6	510	450	30	Internat'l Harvester	UD-14	45	1200

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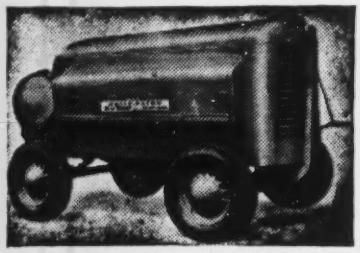

60 CFM INGERSOLL (Gas) SKIDS— $675
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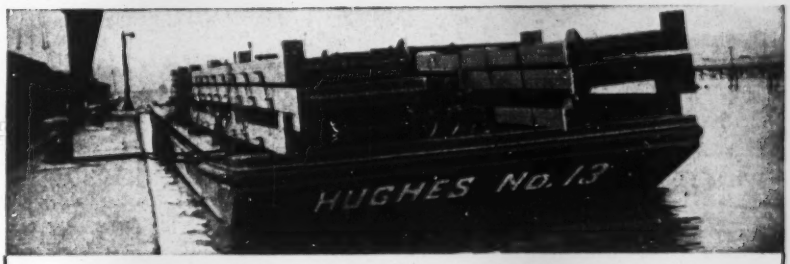

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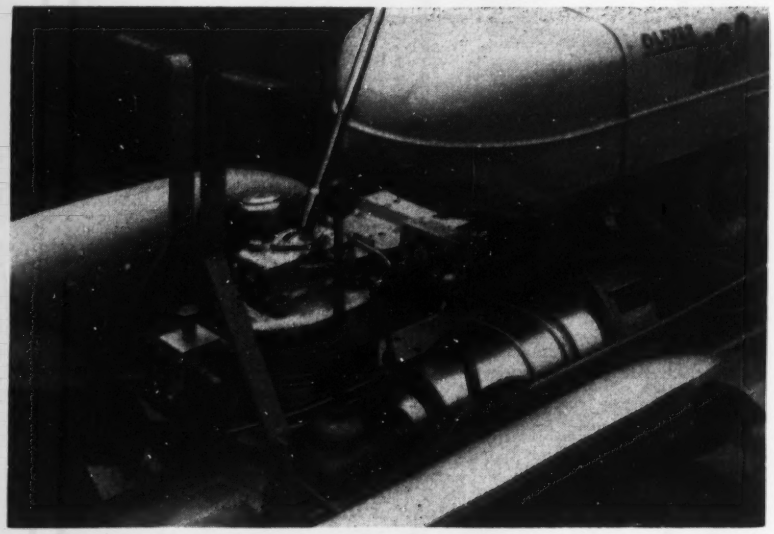

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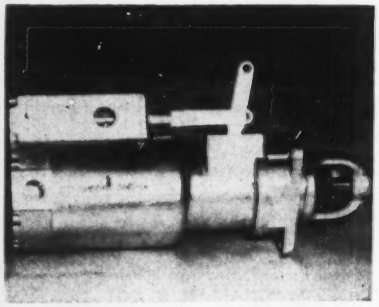

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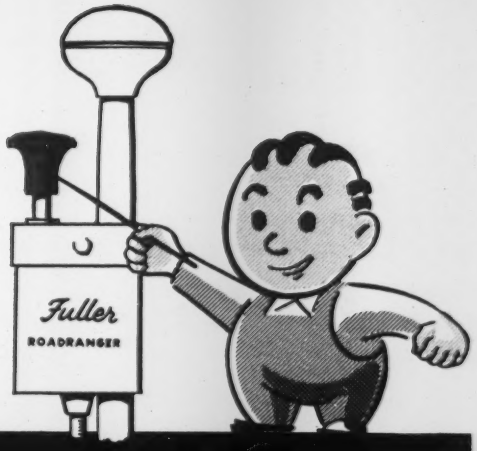

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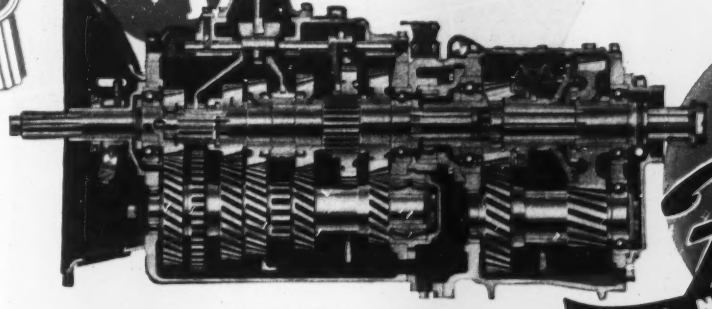

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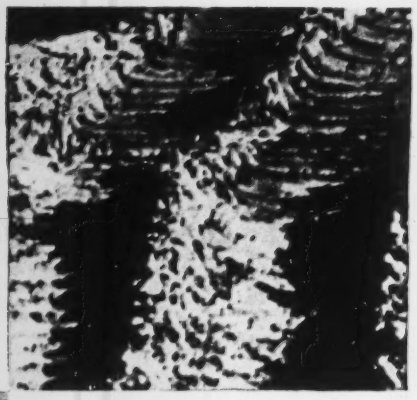
THE TRACK  OF A

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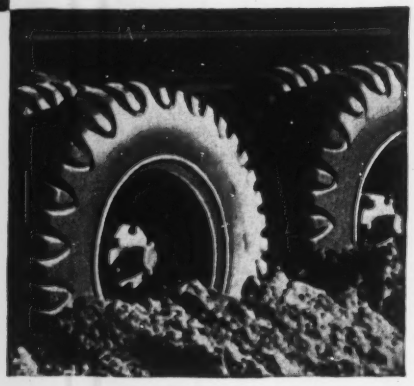
STORY OF  Power

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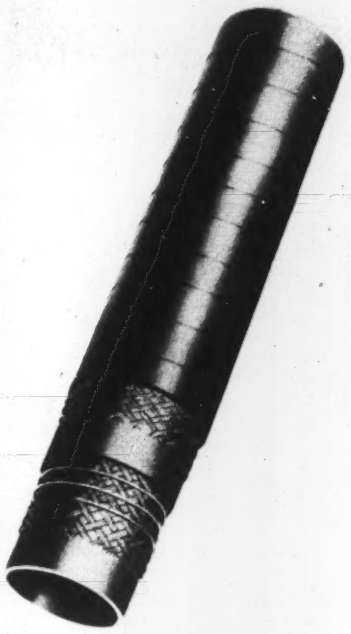

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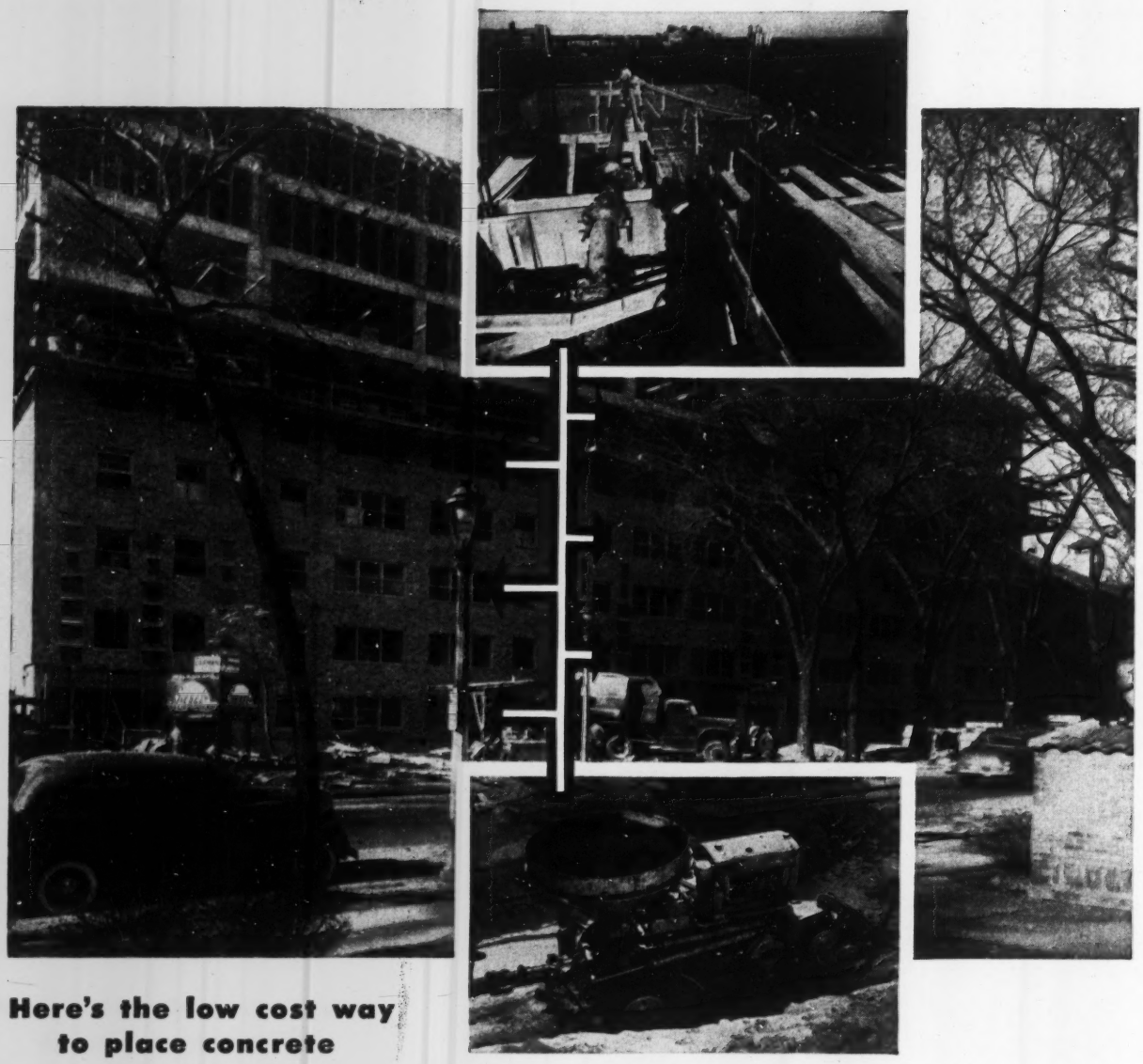

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Printed in U. S. A.

has a swivel action that is said to remain smooth under rugged drilling conditions. The assemby includes a shut-off valve for the control of water flow by the driller.

The water feed drills are designed for production drilling of holes more than four inches deep where many holes are required. Water lubrication prolongs the cutting life of the drill.

It is reported that the new drills are particularly advantageous for drilling concrete including crossed reinforcing rods. They can be used in standard electric and air drill motors with ¾-in. chuck size or larger and with #3, #4 and #5 Morse tapers. TILDEN TOOL MFG. CO., SAN CLEMENTE, CALIF.

New Products briefs . . .

• **Automatic pipe wrench**—A new all-steel automatic pipe wrench operates on a principle that makes it unnecessary to adjust by hand to any particular size. A spring within the head makes the jaws close to any pipe size automatically. The wrench, manufactured by Faver, Inc., 770 South Second West, Salt Lake City, Utah, self-adjusts from ⅛ to 1¼ in.

• **Jaw crushers**—A new line of jaw crushers to be known as the Lippman Rock-Ram crusher is announced by the Lippman Engineering Works, 4603 West Mitchell Street, Milwaukee 14, Wis. The Rock-Ram will be available in sizes 10x16, 10x20, 10x24, 10x36, 15x36, 20x36 and 30x36 in.

• **Flame-proofed gloves**—Gloves and mitts, either lined or unlined, for temperatures ranging upwards to 800 deg F are available from the C. Walker Jones Co., 6135 N. Lambert Street, Philadelphia 38, Pa. Bright red color of the gloves enables supervisory personnel to spot immediately that the proper glove is being used.

• **Oil spray**—A rust-cutting oil, sprayed from an aerosol can, is said to help loosen corroded nuts, bolts and studs. After a short spray from a distance of 6 to 8 in., the manufacturer, E. I. du Pont de Nemours & Company, 7522 Nemours Building, Wilmington, Del., says that a two-minute wait usually permits the compound to penetrate the rust so that the nut can be easily loosened.

Addendum—The arc welding headshield described on p. 178 in the July 16, 1953 issue of ENR is manufactured by the LINCOLN ELECTRIC CO., P. O. Box 3115, CLEVELAND 17, OHIO.

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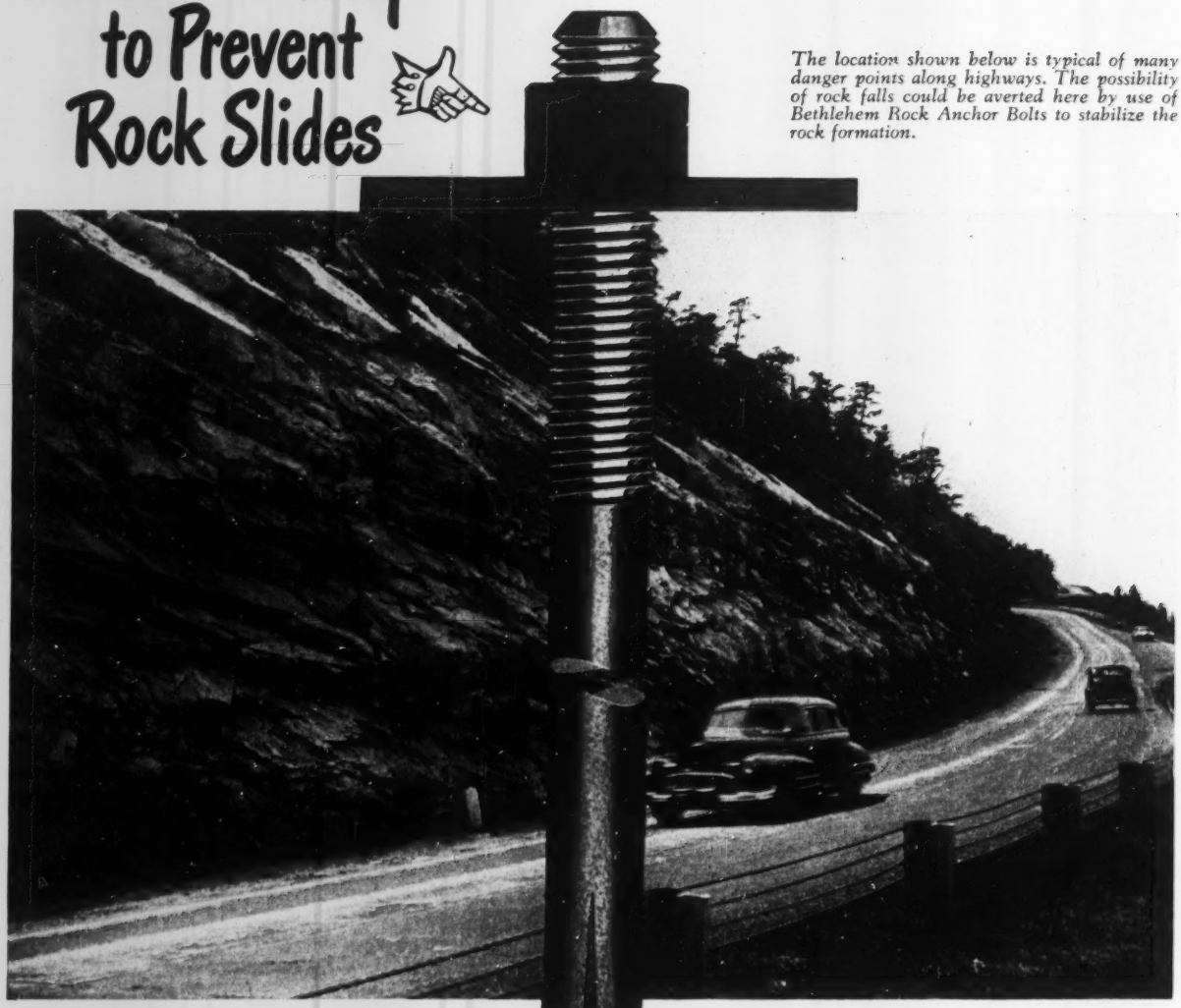
Here's the Way to Prevent Rock Slides

The location shown below is typical of many danger points along highways. The possibility of rock falls could be averted here by use of Bethlehem Rock Anchor Bolts to stabilize the rock formation.



You know from experience the havoc and monetary loss which can be caused by rock slides along rights-of-way. But today many dangerous locations can be made free from such troubles by using Bethlehem Rock Anchor Bolts to stabilize the rock formation.

Bethlehem Rock Anchor Bolts anchor layers of rock or individual boulders to bedrock, preventing them from sliding or rolling. They are ideal for use in cuts with high banks, or on steep hillsides, and are highly effective where the formations which they anchor in turn support adjacent or overlying strata.

Bethlehem Rock Anchor Bolts are 29/32 in. in diameter, and come in lengths of from 2 ft to 10 ft. One end of the bolt has 5 in. of 1-in. rolled threads. The opposite end has a 6-in. slot, made by an exclusive forging process which forms the equivalent of two half-rounds. The slot accommodates a wedge, which is forced deep into the slot when the back of the hole is reached.

The bolts are furnished with an American Standard square nut. They can be installed horizontally or at an angle, and can be used in combination with rock anchor ties, plate washers, and angle washers.

Bethlehem Rock Anchor Bolts are worth looking into. Why not try them out on one of your most dangerous locations? We'll be glad to work out the details with you, whenever you say.

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BETHLEHEM ROCK ANCHOR BOLTS

PUBLICATIONS

French equipment—A manufacturer's directory contains a partial list of French manufacturers of equipment for mechanical treatment of materials. All types of equipment are not covered but, wherever possible, they are grouped under general headings, classified in sections in accordance with their intended use. SYNDICAT NATIONAL DES INDUSTRIES, D'EQUIPMENT, M.T.-P.S. 10 AVENUE HOCHE, PARIS VIII, FRANCE.

Air diffusers—A new 32-page catalog displays the complete "Kno-Draft" line of air diffusers and accessories and their applications. It also provides the designing engineer with performance charts, technical and installation data, information on general duct designs and balancing procedures. The catalog, Bulletin K-20-A, is available from THE W. E. CONNOR ENGINEERING CORP., DANBURY, CONN.

Waterproofing membrane—A new 12-pager describes Glasfab, an inorganic glass waterproofing membrane fabric. Entitled "Let's look at membranes" the booklet outlines the functions and types of membranes available and also the essentials of a good membrane. TWINSBURG-MILLER CORP., P. O. BOX 207, TWINSBURG, OHIO.

Typical sanitary installations—Sixteen pages of illustrated case histories of typical sewage disposal plants. Book 2440, LINK BELT COMPANY, 307 NORTH MICHIGAN AVENUE, CHICAGO 1, ILLINOIS.

New specifications—A bulletin presenting recommended specifications for gate valves for water works service to be used above ground where AWWA specifications may not apply. A 34-page publication that may be of value as a supplement to older specifications. Write for "Recommended Specifications for Iron Body Bronze Mounted Gate Valves for Water Works Service," THE CHAPMAN VALVE MANUFACTURING COMPANY, 203 HAMPSHIRE STREET, INDIAN ORCHARD, MASSACHUSETTS.

Heating control system—Catalog ST-500-1 deals with weather compensated control systems for hot water heating, radiant heating and warm air systems. A complete line of outdoor controls is described together with technical data and typical specification form. SARCOTHERM CONTROLS, INC., EMPIRE STATE BUILDING, NEW YORK 1, N. Y.

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EDITORIALS

The export of U. S. construction

SINCE THE WAR the American construction industry has taken on a new dimension—worldwide breadth. From Afghanistan to Australia via the Azores, and on to India, American men and machines have appeared on the scene in increasing numbers.

But it is not alone that more U. S. civil engineers, architects and contractors than ever before are plying their trade overseas. There is also—or so it seems—a yearning on the part of almost everyone in the business to get a job in some faraway place.

This is an entirely new phenomenon, marking a sharp departure from the situation prewar. Then the industry's foreign legion numbered not more than a dozen firms whose activities were largely confined to Latin America. Nowadays the whole world is the stage, and interest in foreign construction—either in fact or in fancy—pervades the entire industry.

It was in recognition of this fact—and to bring together for the first time the information on the extent of U. S. construction overseas—that the special survey reported in this issue was undertaken. The results are impressive. Every continent is represented. Types of projects under way, while bulking largest in the power and irrigation fields, cover a wide range. And the list of who is working where on what in the foreign construction field is a long one.

All this naturally leads to the question of whether this export of U. S. construction will continue—and in what form. What are the future opportunities?

It is apparent from the survey that the opportunities vary widely in different countries. It seems certain that some types of them will disappear when our military expansion overseas slows down. And as the engineers and contractors of other countries grow in capacity and knowledge—and some of them have been our equals or betters all along—they will offer competition that will be harder to overcome.

Nevertheless, opportunities for U. S. construction overseas will continue to exist. A not inconsiderable number, for example, should be available to those engineers and contractors able to supply some type of design knowledge or construction technique that is indispensible to—and unobtainable in—a particular country. The best and most numerous opportunities, however, will be created by the investment of U. S. capital abroad—just as they are at present, as shown by the survey. But whereas U. S. government gifts and loans now generate many construction jobs, they are apt to be less potent in this respect in the future.

Types of jobs overseas should remain about the same as at present. In old, established countries it is the industrial job—usually of a specialized nature—that will be called for. When investments are made in underdeveloped regions, on the other hand, they will generate a wider range of work—in sanitation, water supply, power, irrigation, industry and transport in about that order.

But in whatever country and on whatever type of job, overseas construction will continue to present problems that have no precedent on the domestic scene. To overcome them will often require a special type of organization, sometimes a special state of mind, and always an infinite amount of patience to understand and work under strange conditions and customs.

Fortunately, as the survey shows, the U. S. now has a considerable body of technical men and firms who have proved by experience that they can master these problems—and as a consequence use investment funds efficiently. And in the end it is the willingness of American capital to go abroad that will make the export of U. S. construction a thriving business.

Niagara Power

WHY there has ever been any question about the wisdom of permitting the private power companies already on the site to develop the additional million kilowatts available at Niagara Falls has always been difficult to see. With plans well along, an adequate engineering staff and ample financial resources, the Niagara-Hudson group of utilities could have construction under way within a few months after permission to go ahead is granted. In Congress, the House, impressed by this situation, passed favorable legislation only to have the Senate delay its decision in order to give the proponents of development by the Power Authority of the State of New York an opportunity to record their opposition to private development.

There is no sound reason why the New York Authority should be assigned the power development at Niagara Falls. In the first place it will have its hands full with the St. Lawrence International Rapids scheme—a proper project for public development. The argument that New York State needs cheap subsidized power to compete with public power elsewhere is not convincing, implying as it does that all power should be subsidized. Actually, private power at Niagara will be more expensive only to the extent of the taxes that the companies pay, and someone must pay the taxes—if not the power users then the general public. Nor is a great natural resource being given away, as some maintain, if the private companies develop the power—they are subject to a 50-year recapture clause and their rates will be controlled by the New York Public Utility Commission.

Niagara Falls is one hydro-electric site where all factors favor private development. A decision to assign the development to any public agency—state or federal—would be a decision in favor of public development everywhere.

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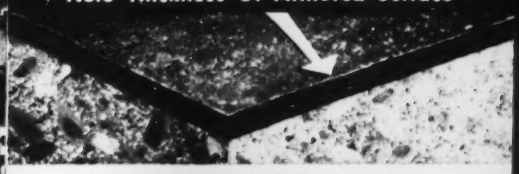

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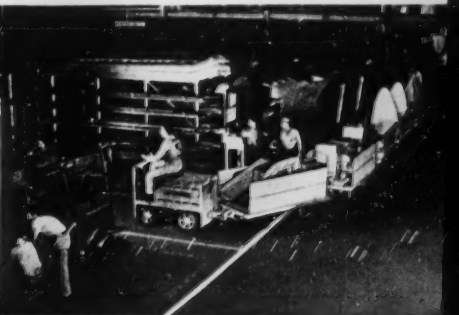

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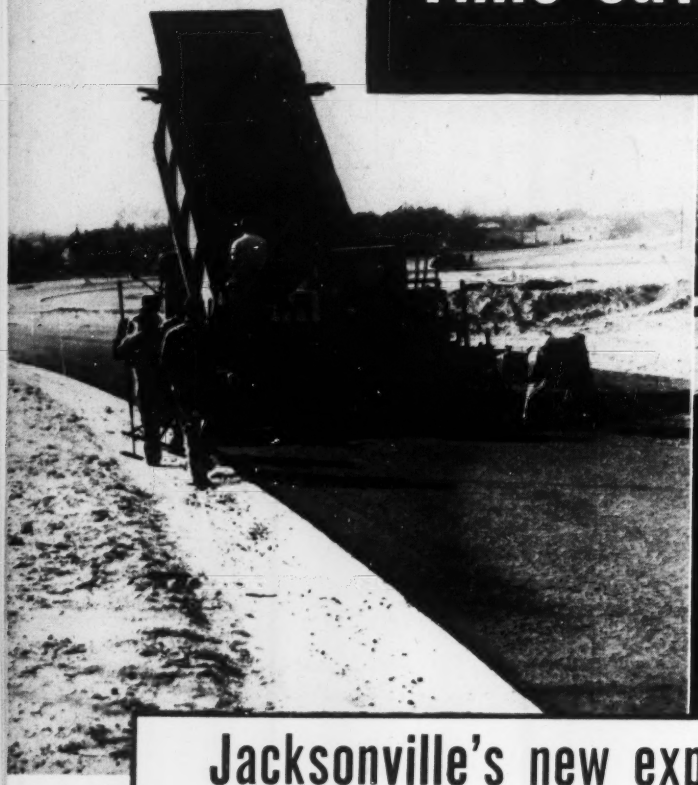

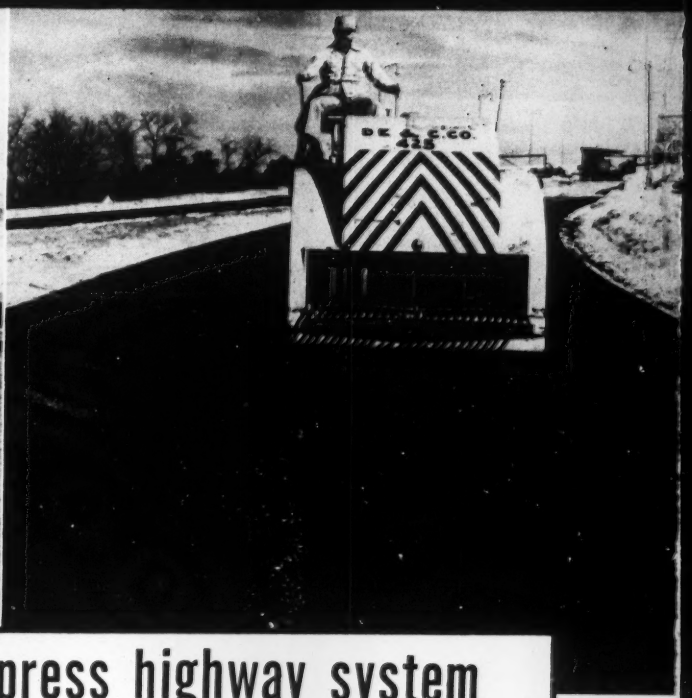

Jacksonville's new express highway system

Now served by 500,000 sq. yds. of hot-mix Texaco Asphaltic Concrete

Hot-mix Texaco Asphaltic Concrete being laid over a limerock foundation on approach to John E. Matthews Bridge, which spans St. John's River in Jacksonville. This and other sections of new expressway system at Jacksonville were constructed by Duval Engineering and Contracting Company of that city.

For two years, the Florida State Road Department has been constructing an elaborate expressway system, which is designed to speed the flow of through traffic converging on the city of Jacksonville from all directions. Approximately a third of the project has been completed to date.

One of the newest and most important links in this long-range program is the western approach to the John E. Matthews Bridge over the St. John's River. To cope with the heavy traffic anticipated on this approach, two courses of hot-mix Texaco Asphaltic Concrete, with a compacted thickness of two inches, are being laid over a limerock foundation ten to twelve inches thick. Up to the present time, more than 500,000 square yards of Jacksonville's expressway system have been paved with Texaco Asphaltic Concrete on either a limerock or shell foundation.

For less heavily traveled sections of the system, sand bituminous construction of the road-mix type has been employed, using Texaco Cutback Asphalt as binder.

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